



FRIDAY, FEBRUARY 22.

Who Are the Heroes?

[Poem read by the author, Mr. Thomas B. Appleget, at the "Evening with Railroad Men," Camden, N. J., Feb. 11, and inscribed to the Employees of the Amboy Division Pennsylvania Railroad.]

Let others sing of Bludsoe, Bradley, Guild—
Well they deserve kind memory and a tear—
But he who holds his manhood undefiled,
Loyal to lowly duty, is their peer.

Are there no living heroes? Must men die
To be accounted noble, true and brave?
Are all the laurel wreaths woven to lie
On pale, unconscious brows, cold in the grave?

Is there no need of praise for him who stands
True at his humble post, whose eye unclosed
Foresees the danger, and whose faithful hand
Holds free from harm the sacred trust imposed?

To go when duty calls from firesides warm,
To walk the track with ever watchful eye,
To bear the red-light through the driving storm,
Or stand to brakes when sleety crystals fly;

To hold a lever and to watch a gauge,
To set a switch, or give a signal true,
To tap a wheel, or drive a spike—a sage
Might call these trifles—but do you?

Let one of these be slighted, only one—
These daily duties of ten thousand men—
And somewhere comes the crash, the shriek, the groan;
Somewhere the roll of death is called again.

I cannot think the smoke of martyrdom
From burning wrecks of human life, will rise
The sweetest incense that shall ever come
From off the altars of our sacrifice.

I cannot think that He who said "well done,"
Unto the one who in "few things" was true,
Will lightly hold us if, from sun to sun,
We faithful prove in that we have to do.

Give honor to the martyrs—those who fall,
And falling have their crown of glory won:
But honor, too, the living heroes, all
Who living lay no duty down undone.

All reverence for the dead. Let anthems ring
Above their graves, and peaceful be their rest.
This honest tribute of respect I bring
To every man who does his level best.

Contributions.

Natural Gesture Signals.

NATIONAL DEAF-MUTE COLLEGE, KENDALL GREEN,
WASHINGTON, D. C., Feb. 18, 1884.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Referring to the discussion among railroad officers concerning the *naturalness* of the various uniform train signals that have been proposed, you ask me for some comparison of these signals with the gestures used by deaf-mutes to express similar ideas in their natural language of signs.

For *Go ahead* the deaf-mute moves his right hand horizontally forward from the left side of his body, ending the gesture with a curve to the right, the forefinger being extended, and the sweep of the arm being greater or less according to his distance from the person addressed or the emphasis with which he wishes to speak. A rapid or slow rate of speed is indicated by the rapidity or slowness with which the gesture is made. The same sign, with various slight modifications, is used by many Indian tribes.*

For *Stop* the usual deaf-mute sign is made by bringing the right hand (open, fingers joined, thumb up) vertically downward with an energetic motion upon the left hand (flat, palm up) held horizontally in front of the body. Most of the Indian tribes whose signs have been recorded employ substantially the same gesture for *Stop* or *Halt*; the essential element of the sign being the energetic downward motion.

For *Back up* the deaf-mute extends both hands in front of him, the fingers of one hand pointing toward those of the other, and moves the two hands simultaneously backward toward his body, drawing an imaginary object back with them. Rate of motion is indicated by the rapidity or slowness of the gesture. I have no record of Indian signs for this idea.

Train parted is a technical term that has not yet entered into the vocabulary of deaf-mutes, though from the infatuation that possesses some of this class to walk on the track they certainly have abundant opportunity to become acquainted with everything pertaining to the subject, but *Parted* is represented by placing the fists together horizontally in front of the body and moving them apart from each other.

My description of these deaf-mute signs may be lacking in clearness, but I am sure that no person, however ignorant of the sign-language, if he saw the signs themselves made by a deaf-mute, could fail to understand their significance, except, perhaps, in the case of the sign for *Stop*; and that this also is a natural sign is evident from the adoption of its essential element by divers Indian tribes unacquainted with one another as well as by deaf-mutes.

I see no reason why these signs are not perfectly applicable to all train signals made by the hand in the daytime, and to those for *Go ahead* and *Stop* at night, but to the signs for *Back up* and *Parted* for night use, there is the objection that they require both hands, and that, if adapted

* A Collection of Gesture-Signs and Signals of the North American Indians, with some comparisons, by Garrick Mallory, Brevet Lieut. Col. U. S. Army. Distributed only to collaborators. Washington: Government Printing Office, 1880.

to the employment of one lantern, they might be confused with one another, or with the signal for *Go ahead*. Looking at the subject, then, from the double point of view of *naturalness* and *distinctness* I can imagine nothing better for day signals than those I see used on the Baltimore & Ohio trains, which pass my house; their signals for *go ahead* and *stop* being based on essentially the same idea as the deaf-mute and Indian signs, and that for *back up* (the hand beckoning above the head) having the advantage of being made with one hand. Their night signals, though perfectly distinct and not unnatural, have the disadvantage—except in the admirable signal for "stop," and up-and-down motion of the hand or lantern—of not corresponding with the signals used by day.

E. A. FAY.

The Proposed Uniform Signal Code.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In continuing the consideration of the proposed Standard Signal Code we come next to the recommendations of the committee relative to whistle signals, which I think have thus far provoked but little adverse criticism. Whistle signals are all more or less arbitrary at best, and in codifying them fewer theoretical considerations come into play. It may be said in general, however, that simplicity should prevail, since the danger of misunderstanding increases with the complexity of the signal; hence for orders requiring a prompt obedience, short signals should be used, and where a misunderstanding would be dangerous, simple (which means short) signals are likewise required. So also for orders in frequent use, shortness and simplicity should be the rule.

Now it so happens that the number of short and simple whistle signals available is limited, and hence the cardinal rule should be that the signals most important and in most common use should be simple in their nature, not liable to be misunderstood nor consuming valuable time in the making of them, and these should be the first ones determined upon in arranging a code. Prevailing practice, however, should be closely followed when it does not conflict with this rule, for the danger and convenience of changing from established usages should be reduced to a minimum.

Testing the proposed code by these requirements, we find that to the stop signal, the most important of all, is assigned the short blast, the shortest and simplest element in the code; and in general it may be fairly said of the more important signals that their shortness and simplicity are made to conform as closely to these requirements as a reasonable consideration for prevailing practice will permit, the few exceptional cases being sufficiently explained by the committee in their report.

Your correspondent "A," however, in your last week's issue makes a good suggestion, which is that in calling in flagmen by whistle signal a distinction should be made between rear and head flagmen, using four blasts in one case and five in the other. Many cases will occur in practice, especially on double-track lines (when crossing over from one line to another, for example, as is frequently done by local freights), when such signals are almost indispensable.

It should also be remarked that objection is sometimes made to the two long and two short blasts recommended as a highway crossing signal. No doubt this is an effective warning, but where crossings are frequent it is somewhat trying to weak nerves, and in one state at least it has been voted a nuisance by the inhabitants, and on their petition to the Board of Railroad Commissioners its use has been duly prohibited in legal form. It might be well, perhaps, where similar objection prevails, to use instead the single long blast recommended by the committee as a station signal. The short blast followed by a long one now coming into use on certain Eastern lines for this purpose is open to the objection that its constant repetition tends to prevent brakemen from responding quickly to the danger signal, as when given they will invariably wait a moment listening for the customary long blast to follow. This signal if reversed, however, would not be so objectionable.

Passing now to the remaining portions of the proposed code, in the matter of bell cord signals there is but little room for criticism, and most of what the committee say relative to stationary signals and semaphores, the use of torpedoes, and the general significations of colors as applied to signaling, is self-evident and will meet with approval in all quarters, but it seems to me, however, that their recommendations relative to the signals to be carried by trains and engines require consideration for these reasons:

1. Red has been usually used to signal, a train following having the same rights as the train carrying the signal, on the theory that there was danger in occupying the main line until the second section had arrived. This formerly was Pennsylvania practice, and still is, unless recently changed. Why should green, the signal of caution, not danger, be substituted? Is the danger less now than formerly? This danger is the danger of head collisions on single-track and of rear collisions on double-track lines—the two most prolific causes of accident which appear in the published tables of statistics. What signal can be a more appropriate warning of this danger than the usual red danger signal? In fact, does not the fundamental proposition of the committee, "Red as the signal of danger," almost require its use under these circumstances?

2. If green be used, however, in this case as the signal for train following with same lights, and the combination of green with white (as recommended) be also used to denote an irregular train to follow, is there not danger when the engine carries a green light of a white light being so held by the engineer or other employé near the engine while standing at a station as to be mistaken for the combination of green and

white denoting an irregular train to follow? Such a mistake would add one more to the already much too long annual list of head and rear collisions.

3. A number of roads, some of them minor Eastern lines with single track and light traffic, use signals to denote that an irregular train is to be expected from the opposite direction. Now, without passing judgment upon that system of running trains, which, however objectionable, presents certain advantages where trains are few, would it not be well to provide a signal which could be used for that purpose if desired? In the absence of such provision each road requiring it will adopt some such signal code or no code.

The committee probably had good reasons for discarding the use of red for signaling a second section to follow, but I think there would have been less chance for a difference of opinion here had they published them. My own ideas on this portion of the code would be about as follows:

Red (danger) for a train to follow having same rights as the train carrying the signal.

Green (caution) for an irregular train to follow.

Blue (caution) for an irregular train to be expected from the opposite direction.

And otherwise as per code as recommended. Moreover, in the Eastern states, and, I presume, elsewhere, it is the prevailing practice when carrying signals to display the same signal both on the engine and at the rear of the train. Now as the committee do not recommend this practice would it not be well for some one to explain what objection, if any, attaches to it, since apparently it much more than doubles the chances that the signals carried are properly observed, for a flag or light carried at the rear of the train is much more readily observed than when placed on the engine alone, and in the case of signals carried for second section the proper observance of them is a vital matter. One other thing occurs to me, which is that the committee make no attempt to formulate certain signals which, I venture to say, are in daily use on every road in the country, principally in yards and on local freight trains. I refer to the hand and lantern signals used in coupling and switching cars—not the ordinary "go ahead" and "back up" signals, but those modifications of them better known as "ease ahead" and "ease back." The ordinary signals are not quite adapted to the special requirements of the case, as any manager can readily ascertain by a little observation. If he has not formulated these signals in his code he will find his men using substitutes of their own. Necessity is in this case most truly the mother of invention. Some roads there are, however, that codify these signals; notably the Maine Central Railroad. What objection would there be to placing suitable signals of this character in the proposed code?

On the whole, the code as recommended is, in my humble opinion, a very good one, and should receive a hearty support from all quarters. I have simply thrown out a few criticisms here and there to elicit further discussion in the matter, but in no wise to advocate anything except its adoption either in its present shape or with slight modifications, if any such should be deemed desirable.

NEW HAVEN, Feb. 19, 1884.

EDWIN A. HILL.

The Vosburg Tunnel.

The Lehigh Valley Railroad is laid along the banks of the Susquehanna River, all the way from Wilkes Barre to Sayre, near the state line, accompanying that stream in all its curves and bendings. By driving this tunnel through Russell Hill, at Vosburg, in Wyoming County, nearly 5 miles of a circuit will be avoided. The distance through the hill is 3,800 ft.; and the tunnel is driven under contract by Messrs. Byron, Hickey & Brodhead, three gentlemen experienced in this class of work. Mr. Byron takes charge of the east end work on the tunnel, and Mr. Hickey of the west end work. They are driving from both ends, and are in at present 900 ft. at each end.

The tunnel was started from the west side of the hill, June 1, 1883, driving it in two benches. Its size, when completed, is to be 28 ft. wide and 21 ft. high—enough room to have two railroad tracks laid through. The upper half, or bench, of the tunnel, about 10 ft. high, is driven forward first, and another set of men following, rising the bottom part or bench, which is also from 10 to 11 ft. high, completing the required height of 21 ft. The upper bench advances more rapidly than the bottom one, because all the rock produced from the former is dumped over the edge of the latter, and has to be reloaded there into the railroad trucks. This additional work causes the progress of the bottom part to be slow as compared to the top. To handle the stuff thus twice involves a large outlay of additional expense; but the time allowed for completing the work requires the adoption of this method, and the extra expense cannot be avoided. The upper bench is driven a distance of over 300 ft., and the bottom one 300 ft. Derricks are used to raise large stones into the railroad trucks. A double track is used for the trucks on both bottom and top benches, and the derricks are stationed on trucks so that they can be moved back easily while the blasts are being exploded. The blasting holes are all drilled with compressed air drills. At the west end the Rand drills and compressors are exclusively used. The cylinders of the compressor being 10 by 16 in., running 115 to 130 strokes per minute, keeping from five to six drills at work, when that many is necessary. From 10 to 15 holes are charged and fired at once. All the holes are charged with the Atlas D, or the Vulcan explosives, and they are exploded by a common hand-battery. The gaseous products of these explosives are rather injurious to health, but upon firing the shots the compressed air-pipes are immediately thrown open and the escaping air takes the smoke and gases away in a remarkably short time. The working faces at both ends of the tunnel are brilliantly lighted with electric lights; the electricity being produced by two five-light dynamos, one located at the entrance at each end. The dynamos were manufactured by the Metropolitan Electric Light Co. The lighting apparatus complete, including nine lamps, cost \$1,300; but Mr. Hickey stated that the investment was highly profitable, enabling them to work to a much greater advantage than if they only used the ordinary miners' lamp. The lamps suspended at the faces can be removed to safe points while the blasts are fired; therefore no damage is done to them. At

the east end the plan of working is quite different to the other, only one bench, the top one, being worked. This was opened through the clay and sand by a small drift, similar to an ordinary gangway in the coal mines, but upon entering the rock it was gradually widened into the required width of the tunnel. This part was then about 12 ft. high and about 26 ft. wide. The rock was brittle and of a disintegrating nature, requiring timbering to support it; and the timbering had to be such that the bottom bench can be raised without disturbing it. I frankly confess that this was the best piece of timbering work I ever saw. In each pair or set there were seven pieces of 14-in. squared timber of the best quality, constructed in a semi-circular form, forming an arch along the roof, large enough to admit the final arch of brick or stone inside of it. Each set of the timbering cost \$40 to put it up, and the work was very skillfully done. The opening of the upper part or bench at the end also is in a distance of over 900 ft. from the opening, but the entrance will have to be enlarged and timbered before the bottom bench can be started. The Ingersoll drill is exclusively used at this opening, having a single compressor 16 by 24 in. in size, running about 80 strokes per minute, and keeping five drills at work. Another kind of explosive or powder is used here, being the Rackarock powder, manufactured by the Rend-Rock Powder Co. The gaseous products of this powder are thought to be less injurious to health than the powder used at the other end, and suits better at this end because the ventilation is not so

The cutter bar *D* has 14-in. stroke with quick return motion, and is counterweighted as shown. These tool clamp studs are placed both on the front and side of the cutter bar, so that the tool may be held in either direction, as desired.

The table, carriage and cutter-bar slides are fitted with a square lock and suitable shoes for taking up wear.

The tool carriage traverses on the cross-head automatically with a wide range of feeds. It can also be adjusted or moved quickly by hand, using the hand-wheel *E* shown on the front.

The driving cone *F* is large and has steps for four changes of speed, and is powerfully geared.

For milling the ports a milling arbor is substituted for the cutter bar, and is arranged to be driven with suitable gearing.

The Future of Bituminous Coal in the East.

The time has come when every user of steam within reasonable access of tide-water or rail markets of coal should face the question whether or not it is wise to make such alterations in his boilers as to fit them for the use of bituminous

carriers of Clearfield coal, provided the railroads are willing to make a reasonable adjustment.

At the current low figures the coal and railroad interests can live, and some of them even thrive. The future will, of course, depend upon the action of the railroads. They may reach the conclusion that they would rather double their profit per ton and carry less coal by combining to ask higher rates. We do not believe that such a course is probable, and we doubt its wisdom. They are not now as absolute masters of the situation as they were only a year or two ago. New lines are entering their preserves and new competitors are appearing at tide-water. The decline in freight rates, which in reality is almost entirely the cause of the falling off in the prices of bituminous coal on the Atlantic seaboard, is therefore likely to be permanent. The effect will be, we believe, one of great benefit to the mining companies and operators, notably in the Cumberland field. Already we have occasion to note almost weekly signs of the capture of new territory. And if consumers gain the conviction that there is no probability of a rise in prices above their means they will begin generally to look with favor upon bituminous coal as a steam-making fuel. We feel convinced that they can be assured on this point. It is likely that the expected increase in the demand will stiffen prices somewhat later in the season, but even the most sanguine do not look for a rise of more than 25 cents per ton.

Unfortunately, we do not possess any accurate data on the comparative value for steam purposes of anthracite as compared with bituminous coal, but even sellers of anthracite are ready to concede that good Cumberland will convert 10 per cent. more of water into steam than anthracite, pound for pound. When the latter is selling at 25 to 30 cents per ton less than bituminous coal it will not be advantageous to use it, other things being equal.

There is one point which will tell much against soft coal, namely, smoke. In some industries this nuisance is so much feared that manufacturers will not have it at any price. We believe that this objection is generally overestimated. With a properly designed boiler setting smoke need not be much feared.

We look forward, therefore, to a heavy increase in the demand for bituminous coal this year. Temporarily, this may embarrass the anthracite companies, and they will be forced more and more to devote their attention to marketing their output in the form of domestic sizes. This will cause a greater breaker waste; but, on the other hand, the multiplication of transportation facilities and the extension of their markets westward will more than compensate for a loss of business, which, at best, they could not hope to hold in the long run.—*Engineering and Mining Journal*.

Facilities for Putting Out Fires on Trains.

The most conspicuous thing about a railroad accident during the present time appears to be the lack of facilities for extinguishing fires or extricating injured persons from under broken cars. Whether the absence of such things is due to carelessness on the part of train hands or on the part of higher officials it is not possible to say; but the fact of their absence cannot fail to be noticed. No car should be permitted to leave the yard without being equipped with at least half a dozen buckets and three or four axes or saws. These articles are all cheap, and they could be stored in different parts of the car where they could be got at in cases of emergency. The axes should not be nailed up against an end of the car on the inside, where they would be as ornamental as a picture frame and just about as useful in case of accident; let two of them be put inside the car in some convenient place and two on the outside, where they can be had when needed. Do the same with the buckets. As a general rule the water in the tender is accessible, and there is usually a sufficient quantity to quench an ordinary fire.

The latest accounts from the Broad Ripple accident, on the Indianapolis Air Line, state that as near as could be judged, nearly every one killed was burned to death; and the same report says that "the newsboy claims that he could have extinguished the fire with a single bucket of water, but it was not to be had." Then there was the Salem disaster, only a little more than a month ago, on the Monon line, the circumstances of which are almost identical with the Broad Ripple accident. The cars fell through the bridge, caught fire from the stove, and, so far as could be learned, every man killed was either burned to death or held down in the water by broken timbers and drowned. With the proper facilities this fire could have been extinguished and at least half the lives saved, besides nearly \$50,000 in property. The Ashtabula disaster nearly eight years ago, on the Lake Shore road, is yet familiar to every one on account of the terrible loss of life. The entire train fell through a bridge into the frozen stream below; the cars took fire from the stove and nearly everybody was burned to death. The fire could at first have been extinguished with two or three buckets of water, and with an axe or two the majority of the passengers could have been extracted from the burning car, but neither buckets nor axes were to be had. Then there was the Glendale horror, on the Great Western, 16 miles from Cincinnati, which occurred about six years ago. For awfulness of detail this accident is without a parallel in the history of railroad calamities. The engine on a passenger train had burst a cylinder head and had to stop on the main track. A flagman was sent back to signal an oncoming freight, but failed to do so. The locomotive of the freight train ran into the rear coach of the passenger, a Pullman sleeper. No one was seriously hurt by the collision, but the headlight of the locomotive set fire to the sleeper, the ends of which were so jammed that it was impossible to get in or out through the doors. One bucket of water could have extinguished the fire, but it was not to be had; one axe or pick could have opened the side of the car, but there was no axe or pick on the train. Four English ladies, sisters, occupying a section of the sleeper near the rear end, were literally roasted to death, while 50 men stood on the outside, able to see them and converse with them, but powerless to help them in the least, all for the lack of two or three tools. Only three weeks ago a car loaded with cotton on the J. M. & L. road caught fire and was totally destroyed, and the fire was discovered in plenty of time to have been put out with two or three buckets of water, but they were not to be had. Last May a baggage car on the L. N. A. & C. was destroyed in the same way, with all its contents. The fire originated with a little oil stove on which a can of coffee was being warmed. One bucket of water could have extinguished the blaze, but by the time the baggage-master found a bucket stored away under some rubbish in one corner of the car the fire was past putting out.

Nearly all the deaths in these accidents could have been avoided had the train been equipped with proper facilities for such emergencies. Another, and perhaps better, plan would be to have the stove so arranged that when it is tipped over a can of water would be automatically poured over the fire, thus putting it out. Or the engine could be fitted with a small pump and hose the length of the train, and water could be used from the tender.

If the legislatures and railroad commissions of this

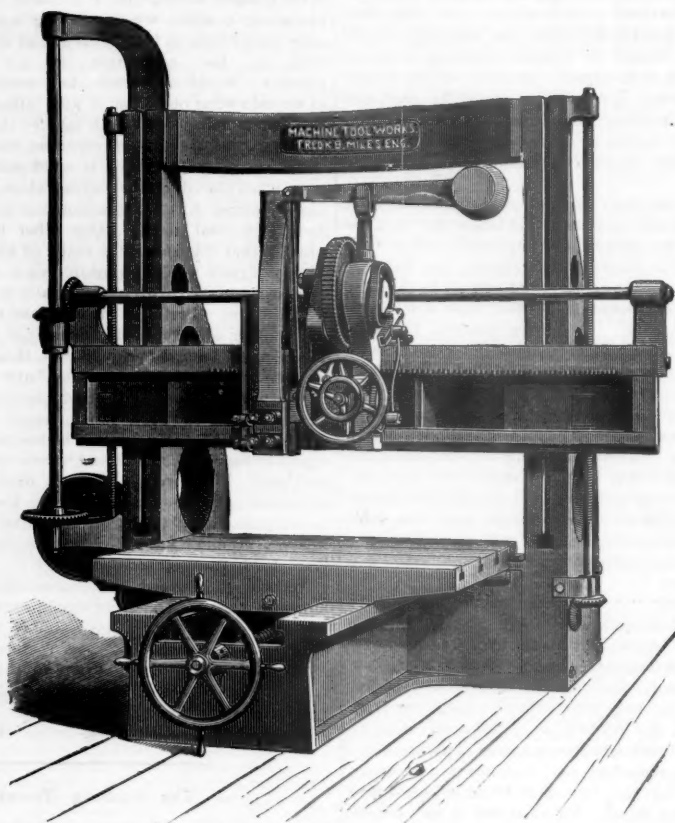


Fig. 1.

CYLINDER PORT SLOTTING MACHINE.

Built by the MACHINE TOOL WORKS, Philadelphia.

effective, owing to the contracted area of the entrance-drift. All through the work appears to be well done. About 250 persons are employed divided into relays of three eight-hour shifts. They are all paid by the day, the wages varying from \$1.25 to \$2.50 per day, according to the experience and skill of the workman. Although extraordinary care is continually taken to examine the roof and pull down the loose material every day, three men have lost their lives by falls since the tunnel began. The company keep a man to inspect the tunnel and see that every loose piece of rock is pulled down and that the work is done according to the requirements of the contract.

A long deep open cut is also being made, leading to the entrance of the east end of the tunnel. This work is done by a powerful steam shovel, and it is very effective, ploughing its way through the clay and sand very rapidly.—*Correspondence Mining Herald and Colliery Engineer*.

Cylinder-Port Slotting Machine.

The engravings represent a new cylinder-port slotting and milling machine which is designed and manufactured by the Machine Tool Works of Philadelphia, Frederick B. Miles, Engineer. Fig. 1 is a perspective view and figs. 2 and 3 elevations.

This machine is designed to slot or mill the ports in locomotive cylinders, the arrangement illustrated being for slotting them. The distance between the posts is 5 ft. 6 in., and from the table to the under side of the cross-head, when at its greatest height, is 5 ft. The cylinder to be slotted or milled is secured to the large square table, which is moved forward to the cutting tool or back by a screw underneath. When adjusting under the tool or moving the work but a short distance the screw can be operated by the hand wheel *A*, shown on end of bed. When it is desired to run the table out quickly, so as to remove the cylinder, the screw is operated by power by throwing a convenient clutch lever *B*, shown on the left of the front view, Fig. 2. A dog *C* on the table throws the clutch out of gear and stops the table at the proper point.

The cross-head is raised or lowered by the same pulleys, *PPP*, that move the table, and its motion can be accurately controlled by means of an overhead shifter lever.

coal. Until now the great bulk of the consumption of coal for raising steam in mills and factories in the Eastern and Middle states has turned to anthracite. The manifest destiny of this trade was, as we predicted years ago that it would be, turned over to other hands than those which have held it so long. Anthracite is too precious a fuel for household purposes to be dumped into blast-furnaces, or be shoveled on to the grates of boilers. Until recently, however, the field of anthracite was little touched because of the high prices of bituminous coal. That obstacle is now being removed, and it is a question well worthy of frank discussion whether the decrease in the difference of prices between anthracite and bituminous coal is likely to continue favorable to the latter. Ten years ago the Cumberland Region and the company controlling its outlet by rail to tide-water, the Baltimore & Ohio Railroad, had no competitor. Overrating its capacity to crush any rival, it allowed the Clearfield operators, with their powerful ally, the Pennsylvania Railroad, to gain a foothold. Year after year, the younger competitor gained in strength, sweeping the market more and more thoroughly by concessions which the backing of their carrier enabled them to make. In 1883 some effort was made to bring about an understanding between the Pennsylvania and the Baltimore and Ohio railroads, to maintain the rates ostensibly agreed upon and to abolish private drawbacks. It failed, and before a number of the Cumberland shippers had succeeded in convincing their carrier of the gravity of the situation their rivals had secured most of the heavy contracts. It appears that, though slow to comprehend it, the managers of the Baltimore & Ohio Railroad have been taught a lesson. Recent developments prove that they have followed the example of their competitors. They must have given their snippers of coal from the Cumberland region ample assurance of support in their efforts to secure a reasonable share of the business this year, because there is no doubt that Cumberland coal has been offered at \$2.50 per ton, f. o. b. at Baltimore, equivalent to \$3.75 in this city, \$3.90 at Boston, and \$3.80 at Sound ports. These figures, of course, are for contract lots, and it is useless to say that they are met by the Clearfield operators. They prove beyond a doubt that the published tariff rates on coal from Cumberland to Baltimore are nominal. It is a fact which railroad managers appear ready to admit that, under ordinary conditions and with a heavy traffic, a rate of three-quarters of one cent per ton per mile will leave a very handsome profit for hauling coal. With Cumberland coal selling at \$2.50 at Baltimore the carrier can certainly reap a very large profit, and leave a satisfactory margin to mining companies not burdened with an excessive indebtedness. The same is true of producers and

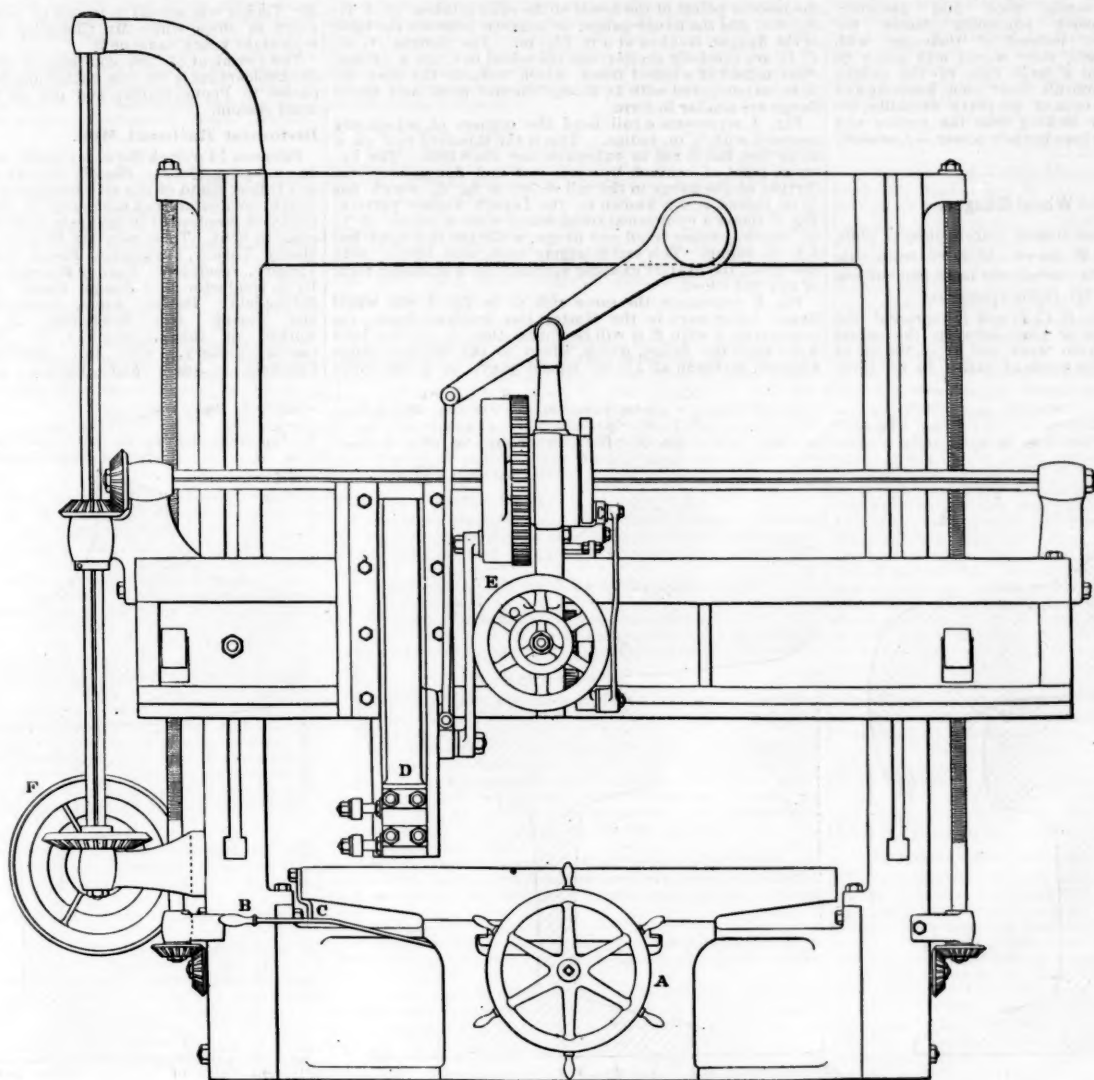


Fig. 2

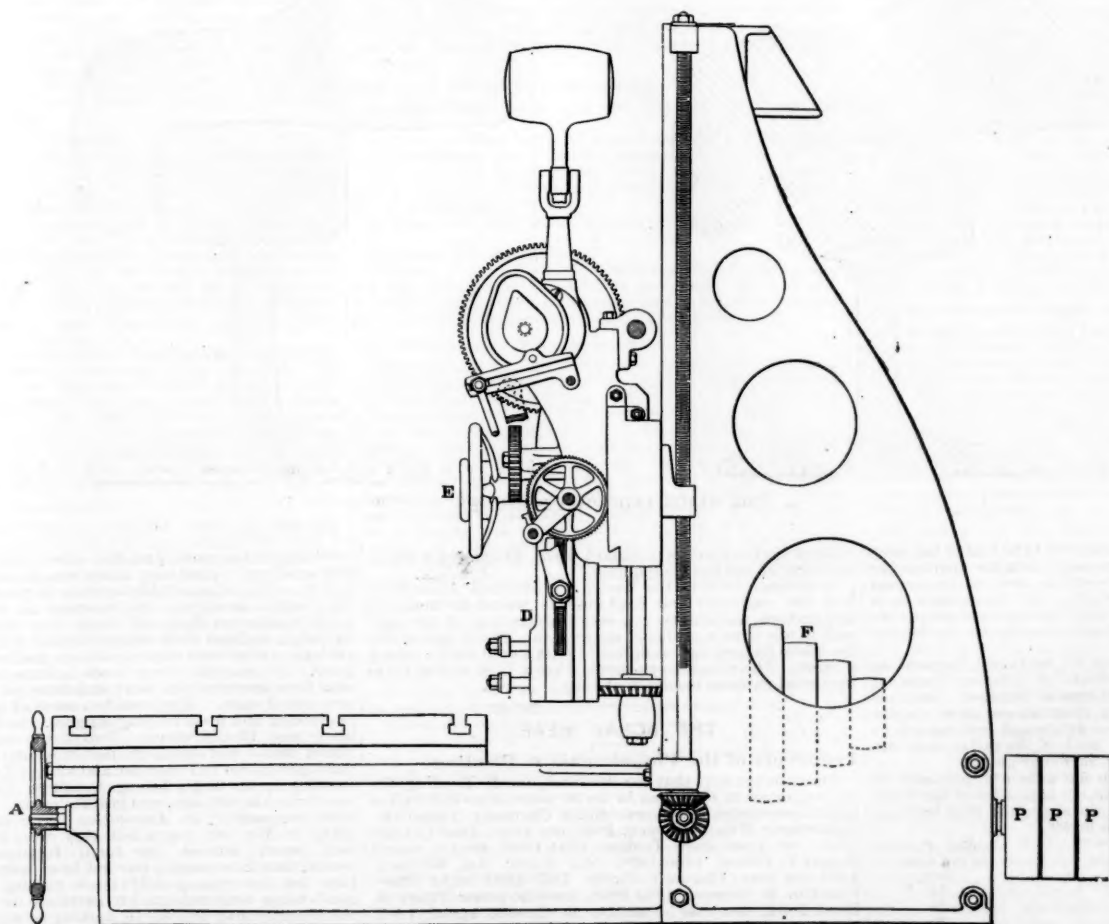


Fig. 3.

CYLINDER PORT SLOTTING MACHINE.

Built by the MACHINE TOOL WORKS, Philadelphia.

country would devote some time and attention to the subject of properly equipping trains for emergencies of this kind, instead of tinkering with the rate sheets of the roads, they would add much to their usefulness in the eyes of a large class of the public. Railroad managers would consult their own interests and save thousands of dollars' worth of property annually, besides many human lives, by locking into the matter and remedying the evil so far as lays in their power.—*Louisville Courier-Journal*.

Rail-Heads and Wheel Gauges.

At a recent meeting of the Master Car-Builders' Club, held in New York, Mr. W. W. Snow exhibited some diagrams, which we reproduce in our present issue, and subjoin the following extract from Mr. Snow's remarks:

The accompanying cuts A, B, C, D and E represent the variations in the clearance or play between the wheel flanges and rails arising from wear, and from the use of different radii in rounding the heads of rails. In all these

the nearest points of the heads of the rails is taken at 4 ft. 8½ in., and the flange gauge, or distance between the back of the flanges, is taken at 4 ft. 5½ in. The flanges A, B, C, D, are precisely similar, but the wheel in C has a cylindrical instead of a coned tread, which reduces the play by ½ in. as compared with D, though the rail head and wheel flange are similar in form.

Fig. A represents a rail head the corners of which are rounded with ¼ in. radius. This is the standard rail on a large line, but is not in extensive use elsewhere. The extreme point of contact between rail and flange is ¾ in. further up the flange in the rail shown in fig. B, which has ½ in. radius, and is known as the Lehigh Valley pattern. Fig. C shows a cylindrical tread wheel with a curve of ¼ in. radius, joining tread and flange, while the rail head has a ½ in. radius. This rail is largely used, and forms, with the tread, the nearest existing approach to a standard form of rail and wheel.

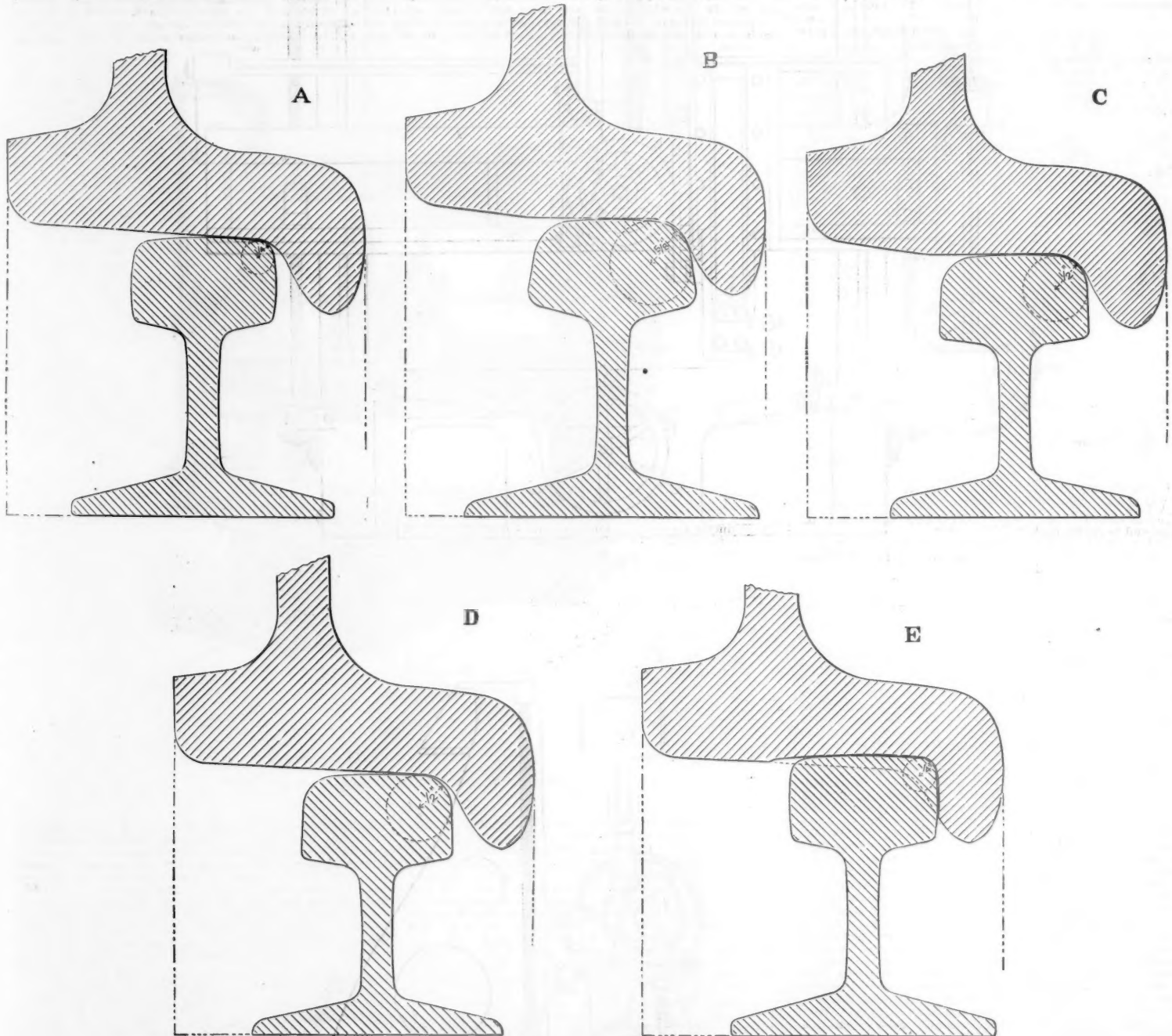
Fig. E represents the same rail as in fig. A, the wheel flange being worn to the Master Car-Builders' limit. On comparing A with E it will be found that ¾ in. has been worn from the flange, which, added to the original gauge allowed, makes in all 1½ in. lateral play. It is therefore

Mr. Tucker was second in length of service, having been 12 years in office, while Mr. Chauncey and Mr. Smith, each with eight years, came next.

The President of this company is elected directly by the stockholders (as is the case with a number of the older companies in Pennsylvania), and not by the board, as is the usual custom.

Dishonest Railroad Men.

Between 11 o'clock Saturday night and 10 o'clock yesterday morning, Deputy Sheriff Abbott of West Springfield and Officer Hadd of this city brought to the station-house 10 freight conductors and brakemen of the Boston & Albany Railroad, implicated in the train robberies which have just come to light. These men are William Bascom, conductor; Henry Varney, brakeman; Frank Bitt brakeman; C. B. Vickery, conductor; Barney Caravoo, brakeman; James Reed, conductor, and Joseph Pacall, brakeman, of West Springfield; Daniel Ames, conductor; Samuel Lord and Joseph Gile, brakemen, of this city. All worked on the Springfield & Worcester Division, except Vickery, who ran between this city and Pittsfield. Ames and Varney are charged with



RAIL-HEADS AND WHEEL GAUGES.

figures the rails may be considered to be laid to the same gauge, and the wheels set to the same distance apart on the axles, and yet a wide difference will be seen in the amount of side play permitted to the wheels. All the figures show the flange of the wheels as near the rail as is compatible with the tread of the wheel actually bearing on the head of the rail.

The *Railroad Gazette* for Aug. 25, contained illustrations and figures showing the ill effects of different forms of wheel flanges and varying distances between backs of flanges, but the accompanying illustrations show clearly that the amount of play between flange and rail depends as much upon the form of the head of the rail as upon the wheel gauge, the rail gauge, or the flange gauge.

Assuming that both wheels on the axle are precisely of the same form, and that the rails on both sides of the track have the same contour of head, the amount of play between the flange and the rail will be as under:

	Play, Inch.	Radius of corner of rail head, Inch.
A.....	1/4	1/4
B.....	1/2	1/2
C.....	1/4	1/4
D.....	1/2	1/2
E.....	1 1/2	1/4

The word play is used to signify the distance which the pair of wheels and axle can shift sideways without springing the axle or spreading the gauge. The gauge between

evident that not only a standard wheel flange, but a standard form of rail-head is required.

Conference between the Master Car-Builders' Association and the engineers and road-masters would do much to bring about uniformity. A large proportion of the rails now in use have a radius of about ¼ in. This is unsuitable for wheel flanges, as it is difficult to get a chill with so sharp a curve. The wheel flange should have a ½ in. radius to insure good uniform results in chilling.

THE SCRAP HEAP.

Presidents of the Philadelphia & Reading.

An exchange says that the Philadelphia & Reading Co was organized in 1834, and in the 50 years of its history has had 10 presidents, as follows: Elihu Chauncey, 1834-1842, eight years; Wm. T. Emory, 1842, one year; John Cryder, 1842, one year; John Tucker, 1844-1856, twelve years; Robert D. Cullen, 1856-1860, four years; Asa Whitney, 1860, one year; Charles E. Smith, 1861-1869, eight years; Franklin B. Gowen, 1869-1881, twelve years; Frank S. Bond, 1881, one year; Franklin B. Gowen, again, 1882-1884, two years; George deB. Keim, 1884, now in office.

Mr. Gowen thus served the company 14 years, or two years longer than any preceding president, although his term was broken into by Mr. Bond's year of service. Mr. Bond, however, never had the management of the road, as the receivership continued all through his term of office.

receiving stolen goods, and the other eight with breaking and entering. Lord and Ames were bailed out yesterday, and the rest held a sociable together in the detention room. They will be arraigned this morning at the police court, when conductors Hunt and Clapp, who were arrested Friday night and had their cases continued in Saturday's court, are expected to turn state's evidence and convict the whole gang. No searches were made in these cases, because the men have suspected discovery and have put the stolen property out of sight. Furthermore, much of it was in the line of clothing and housekeeping supplies, which are either used up or past identification. Two of the ringleaders, one of whom stole a seal-punch in the West Springfield freight yard, got scared in December and made off. The credit of working up the thefts belongs to Officer Hadd, who began on it over a month ago, and last Thursday notified the railroad company of his discoveries. The thefts have been going on for two years, but they were for the most part such small articles, or small fractions of large invoices, that the company has not been asked to settle for their loss, and consequently knew nothing about it. The goods taken were consigned to parties in the West, who did not consider their loss worth making an attack on the mass of red-tape with which the Boston & Albany road defends itself against settling claims for freight loss. No losses have been paid here for three months. One of the most valuable pieces of freight stolen is a silver tea-set, recovered Saturday, the loss of which was never reported to the road. The wives and children of some of the arrested brakemen each

have a half-dozen or more pairs of nice boots which have been worn but two or three times, and have no store mark on them. Velvet, silk, rubber coats and sugar, are among the goods stolen. The thiefing was nearly all done in the vicinity of Charlton, and much of it while the cars were in motion. Sometimes the roof of the car would be raised so that a man could drop inside, and sometimes the car door would be lifted off its hinges.—*Springfield (Mass.) Republican*, Feb. 18.

A Caution.

Mr. E. S. Hill, Chief Ticket Clerk in the Auditor's office of the Canadian Pacific Railroad, Western Division, requests us to publish the following announcement: "On Dec. 31, 1883, James Papillon Moore, employed in the ticket auditing department of the Canadian Pacific Railroad, absconded from Winnipeg leaving behind him debts to a considerable amount. He is 21 years old, height about 5 ft. 4 in., dark complexion and hair, deep set eyes, low forehead, high cheek-bones, slight dark mustache, and untidy and dirty in appearance, English by birth, but with only a slight accent. Was formerly employed by the London, Chatham & Dover Railway Company in London, England, and in 1883 in the Comptroller's office of the Louisville & Nashville Railroad under the name of Papillon, and also in Cincinnati, name of the company unknown. He is remarkably quick at figures. Railroad officers are warned against this man, and any one having an application from such a person will confer a favor on Mr. Hill by notifying him of the fact."

A Stingy Traveler.

"Talking about stingy men," said a conductor of a Pullman car, as he sat in the smoking-room while the porter was doing the work, "the worst specimen I ever saw came out of Detroit the other night. His wife, a great fat woman, was with him, and they took seats in the ordinary coach. Pretty soon he came back, selected a berth—a single upper—and then went back to his wife. Pretty soon he returned, and went to bed alone. About an hour after this I was going through the train, when the fat woman stopped me and wanted to know if I had any empty berths. I told her there were plenty of them, when she brought her lips together like a vise and clenched her fat hands, as she said: 'I thought as much. Here, take my bag with you, and make me up the best section you have. I'll be back as soon as the train stops again.' You see that selfish cuss of a husband of hers had told her there wasn't an empty berth left, but he had found a chance to share a bunk with an acquaintance. He was the maddest man you ever see next morning, when he had to hand over \$5 for her night's rest, in addition to the \$2.50 he had paid for his own."—*Baltimore Day*.

Didn't Go.

"I say, Mr. Railroad man," remarked a determined looking woman, as she entered the Petaluma station the other day, "where's the man that pays damages to widows and orphans?"

"Have you a judgment against the company?" said the pasteboard dispenser.

"I've got my own judgment that this concern owes me about 5,000 hard John dollars. My husband fell off your drawbridge out here while out duck hunting last Tuesday, and I thought I'd just drop in and settle on my way home from the cemetery. Show me the man with the sack."

"Did a train run over the deceased?"

"Run over him—of course not—suppose he was a snail? He was kicked off the bridge by Tom Thompson's old goose gun and broke his neck."

"I'm afraid, madam," said the urbane dispenser of stop-overs, "that your claim has not the proper legal elements to warrant its adjudication."

"Talk Californian, young man," said the widow.

"I mean that duck shooting damages don't go."

"Don't, eh? And I've got to turn to and pick hops this winter to support the family, have I?"

"Looks that way, I'm afraid."

"Oh, it does, does it?" screamed the indignant relict. "That just settles your hash. I'll just sell Henry's old clothes and his pointer dog, and start an anti-monopoly paper down at Shag Landing right away. If I don't make your rotten old thieving corporation get up and howl before I'm through, it'll be funny. Tell old Crocker to look out for himself," and upsetting the water-cooler with a vicious jab of her umbrella, the female Kearney switched out.—*San Francisco Evening Post*.

Nitro-Glycerine as Baggage.

The case of W. H. Hunt, of Olean, charged with shipping a satchel filled with nitro-glycerine from Bradford to Olean, over the Buffalo & Philadelphia Railroad, came up before United States Commissioner Fairchild, at Buffalo, Feb. 16. Oscar W. Hamilton, baggage-master at Olean, testified that he received a black bag on Feb. 7. It was not labelled and did not have any placard stating that it contained nitro-glycerine and was dangerous. The bag fell on the platform and a package dropped out which looked like patent medicine. The bag was found to contain a number of similar packages, also a box of percussion caps. The satchel contained forty or fifty of the little cylinders.

Geo. W. Hickok, of Bradford, testified that he handled nitro-glycerine for several years in shooting oil wells. He had seen the cartridges contained in the bag, and thought they contained about half nitro-glycerine and half tanbark ground fine. The case was then adjourned. It appears that the compound is manufactured near Olean for H. Van Campen. It is used principally for blasting purposes. Hunt keeps a drug store at Olean, and bears a good reputation. The penalty is a fine of from \$1,000 to \$10,000.

The Traveling Population.

The Philadelphia Times, in a lengthy article on this matter, says: "There is a distinct railroad population that is constantly growing. It is composed of commercial travelers, lecturers, show agents, actors and actresses. They eat more meals in hotel cars and railroad meal stations than they do at home or in hotels; they spend more nights in sleeping-car bunks than in beds. To a person who travels only occasionally it is interesting to note how thoroughly equipped these professional journeyers are. Upon entering a sleeping-car early in the evening, for instance, they remove their shoes and put on slippers, hang their hats up and don silk traveling caps, take off their coats and put on short sack coats or smoking jackets."

"In the morning, when the occasional traveler, obliged to wear the only clothing he has brought, goes to the toilet compartments in his coat and vest, and thus struggles in an effort to cleanse his skin without soaping his sleeves or his coat-collar, these professionals again excite his envy. They come along all smiles, having slept well, and feeling perfectly at home. They hang up their smoking jackets and display snowy night robes, ornamented with colored binding and braid, and capable of being thrown open at the neck and rolled up above the elbows. From a pocket in the suspended jacket one produces an ivory-backed brush and costly comb, a tooth-brush, and perhaps a nickel-plated soap-box. Another opens out a prettily-embroidered receptacle, composed of many folds, each one a pocket and each one labelled. In these pockets are a comb, a brush, a tooth-brush, shaving-brush, soap-box, pair of razor cases, nail-brush, whisk-broom, hand-glass and cologne bottle.

Their familiarity with their surroundings is as noticeable a part of their equipment. A glance out of the car window is almost certain to reveal to them their whereabouts when they arise or when they are waked up or are about to go to bed. They carry time-tables in their heads, and give good advice as to which station has the best caterer. They are sociable and democratic."

A Big Land Slide.

A heavy land slide occurred on the Pine Creek Railroad, between Wellsboro and Jersey Shore, Pa., on Wednesday, Feb. 6. For the distance of a quarter of a mile the whole side of a hill seemed to come down, carrying with it huge trees that were not disturbed in their positions, remaining upright, so deep was the slide. In some places the track was covered with earth that reached to the top of the telegraph poles. Consequently no trains were run for several days, until large gangs of men, kept constantly at work, had cleared the track.

Remembering Ashrabula.

An exchange says that elegant and expensive bouquets are frequently dropped from the car windows as trains are passing over the Ashrabula bridge—mementoes from people who had a friend go down in that dark abyss when the bridge gave way while a passenger train was passing over it a few winters ago. It is the only grave they know of a lost loved one, and the flowery offerings are held in as much reverence as though tenderly laid upon a grave in a cemetery and are rarely molested.

The Man With a Pass.

There was a stranger from down the river hunting along the wharves yesterday in search of the office of a certain steamboat line, and by and by he came across a man who replied:

"Why, sir, that line went out of existence last fall!"

"All gone, eh?"

"Yes, sir. No boats—no office—no nothing."

"Well, that's a mean trick to play on a man, and I don't care who hears me say so! I'm a fisherman from down below."

"I see."

"Last fall one of the boats of that line backed into my skiff and smashed it to pieces and drowned my old woman."

"Too bad."

"You bet it was! They were very anxious to settle, and I was offered a free pass over the line for life or \$25 in cash. The old woman was worth more'n that, but I didn't want a law suit, so I took the pass. I thought it would be kind o' nice to sail up and down the river whenever I wanted to and have nobody demanding tickets."

"Well, you are left."

"Sure's you're born! Left on a good skiff—left on a wife who'd catch more bass than any two men in Detroit—left on a pass from Detroit to Malden, good for life! Stranger."

"Yes, sir!"

"Please move on and get out of this, for I'm going to tie down the safety-valve and knock somebody into the middle of next week!"

His informant skipped out, and as he glanced back over his shoulder he saw the holder of the pass climbing into a coal yard to lick three drivers.—*Detroit Free Press*.

Ways That Are Dark.

A conductor reports how some porters in the sleeping cars accumulate wealth: "A Pullman passenger jumps aboard late at some intermediate station. He is tired and sleepy. He wants to go to bed at once. Usually the berths are made up."

Why certainly! the porter says, 'tumble right in. Just give me your fare and when the conductor comes along I will turn it over to him.' The passenger is delighted with the courtesy. He pays his Pullman and car fare, \$10 or \$20, as it may be, and retires for the night. Meanwhile the porter has got a number of trip checks, most likely from the hats of some fellows who are dozing away in the smoker, and presently returning he inserts one under the hat rim of the belated traveler. The train conductor comes around in the morning, takes up his checks and everybody is happy.—*Exchange*.

The Humiliation of the Thing.

Doctor—"And how do you feel this morning, my poor fellow?"

Sufferer—"Much better in most ways, but I am afraid I won't mend very fast; I worry too much."

Doctor—"You have nothing to worry about. You will not lose any of your limbs, and the railroad can be made to pay heavy damages."

Sufferer—"I know that; but just think of the humiliation!"

Doctor—"The humiliation?"

Sufferer—"Yes; I was considered a man of energy and activity, but now my reputation is ruined. No one will want to employ a man who was so lazy as to get run over by an accommodation train."—*Buffalo Express*.

An Aristocratic Engine-man.

Speaking of the death at the early age of 31 of Lord Grosvenor, eldest son of the Duke of Westminster, the English Astor, the *Railway News* says: "Although not officially connected with the administration of railways, he displayed a very active interest in their working and management, and the fast mail train from London to Holyhead, known as 'the wild Irishman,' was frequently driven by him. He was well known and much respected by every engine driver on the northern section of the London & North-western Railway, and spent a large portion of his time in the workshops and mechanical department of the works at Crewe. A correspondent informs us that he was 'really a worker,' and that he took an 'intense pleasure in the lathe, and in the finishing of any work which he took in hand.'"

A Switchwoman.

Mrs. Mary Carroll tends the switch at the railroad junction about one mile from Macon, Ga. Her husband, James Carroll, was switchman 10 years before his death, which occurred in 1862. Since that time she has taken his place, performing the duties with the regularity of a clock. She has not been from her post more than two months in the 21 years, and that on account of sickness. She is 62 years of age and stays in the switch house from 6 in the morning until 6 p. m. During her entire management of the junction she has never misplaced the switch.

A Novel Detention.

A recent Albany (N. Y.) paper says: "Train 49 on the Boston & Albany Railroad, last night, was reported two hours late at Becket on account of a hot draw-bar."

Forging Tickets.

Robert McMichael, a former employé of the Erie, who resides at Susquehanna, was arrested at Waverly Monday, on a charge of forging a railroad ticket. The ticket was one from New York to Port Jervis, and McMichael changed it so as to read from New York to Buffalo. He left Susquehanna on train 8 Monday morning. Conductor Muzzy immediately saw that the ticket was a forged one and

closely questioned McMichael. The conductor contemplated bringing his passenger to Elmira and turning him over to the police. McMichael professed willingness, but left the train at Waverly. Word was telegraphed back and he was quickly arrested and brought to Elmira. At the police station he confessed to forging the ticket.—*Port Jervis (N. Y.) Gazette*, Feb. 19.

TECHNICAL.

A Link Motion Model.

Fred. W. Richardson of this city has presented to the Rensselaer Polytechnic Institute a beautiful model of the link and valve motion of the locomotive. The model, which is similar to those Mr. Richardson is manufacturing for the use of the master mechanics of some of the largest railroad corporations of the country, illustrates perfectly the link and valve motion of the locomotive under all possible practical conditions, and is valued at about \$450. The gift, which was entirely unsolicited and unexpected, is thoroughly appreciated by the institute authorities.—*Troy (N. Y.) Times*.

A Large Round-House.

The new round-house of the Baltimore & Ohio Railroad Co. at Pratt and Poppleton streets, which has been built expressly for the construction of parlor and sleeping-cars, will be occupied on Tuesday next. It is the largest round-house in the world under one roof, its dimensions being circumference, 770 ft.; height of walls to cornice, 25 ft.; and height of building from base to apex, 135 ft. The walls are of the best quality of hard brick and the roof is a combination of wrought-iron, slate and wood something entirely novel and designed by the Superintendent, Mr. C. McLane, so that should the roof from any cause get on fire, it will not fall. It is supported by wrought-iron pillars and cross-beams, which reach from the sides to the pillars over 100 ft. high in the centre of the building. Above this there is a dome 91 ft. in circumference, and above is a large cupola, which will support a flag-staff. The turn-table is 60 ft. in diameter, the length of the standard parlor cars, and there are stalls sufficient to permit the building of 22 cars at one time. Especial attention has been paid to the foundation of the structure, as it was in that part that the former car shops caught fire and were destroyed. Besides using the best quality of Falls-road stone, the space between the tracks has been filled with salt water sand, which, when it becomes solidified, will be superior to concrete. This part of the work was done under the direction of Mr. Patrick Conway, one of the oldest attachés of the road. The building throughout was planned by Mr. C. McLane, under whose superintendence it was built.—*Baltimore Day*, Feb. 18.

Work in the Baldwin Locomotive Works.

We are authorized to state that the reports going the rounds of the press that the Baldwin Works have received an order for 120 locomotives for Russia are without the least foundation. They have not received any orders from Russia for some years, and do not expect any at present. All the foreign orders this firm has are for 16 locomotives for South America, and one for Cuba. Some engines are in the works for Australia, but they are nearly ready for shipment. Orders are getting very scarce, and the company expects to reduce force of workmen directly should no improvement in the business prospects intervene. In looking round the works, we noted several new features of construction. They have adopted a new plan of connecting the top and bottom frames at the front end of consolidation engines. The lower frame is curved up in front of the cylinders, carried below and parallel to the top frame, and the two are joined at the extreme front by means of a heavy casting, to which the bumper beam is attached. It makes the front end very strong, to withstand the shocks of heavy freight service. There is a group of engines in course of construction for the Norfolk & Western Railroad, which is 5 ft. gauge. As it is intended to change the gauge of this road, the engines are made in such a way that they can be readily adapted to standard gauge. The usual way of preparing a locomotive for a change of this kind is to insert a block between the saddle openings, to admit of the cylinders being closed. This, of course entails changing the position of the frames all round, and the wheels have to be moved on the axle. All that work will be saved on these engines. The driving wheels are cast very wide, so that when the tire is placed on the outside they are wide enough for the 5 ft. gauge. When they want the engines for standard gauge, all they have to do is to heat the tires and move them to the inside edge of the wheel periphery, when they will be ready for work. To do that and move the truck wheels on their axles is a small job for such an important change.—*American Machinist*.

This plan of providing for a change of gauge is not new, having been used on some engines built at the Grant Locomotive Works a number of years ago.

The Electric Light on Railway Trains.

Electric lighting of trains by an arrangement devised by an engineer, Mr. Massey, seems to give every promise of practical and continued success. After nearly three weeks' working without hitch, the experiment of the direct electric lighting of one of the District Railway (London) trains between Kensington and Putney is looked upon as a success. The train is provided with plant consisting of a launch boiler, a Willan's three-cylinder single-acting compound engine, running at 500 revolutions, and driving direct a Siemens shunt-wound dynamo supplying current for 50 Swan 20-candle power incandescent lights, requiring about seven indicated horse-power.

Efficiency of Non-Conducting Compositions.

Some interesting experiments have been lately made in England by D. K. Clark, a well-known authority on railroad engineering, as to the relative efficiency of different non-conducting compositions for covering steam pipes. The pipes tested were exposed to the wind under a shed open on three sides. The strength of the wind was found to have more influence than the temperature of the air on the quantity of water condensed. This would seem to indicate that the boiler of a locomotive moving rapidly through the air must lose a considerable amount of heat by condensation, and should, therefore, be efficiently lagged.

The following are the manufacturers, named alphabetically, whose compositions were tested: The Eagle Non-conducting Cement Co., Canning Town; the composition consists for the most part of clay. A. Haack & Co., London; W. Berkefeld's fossil meal composition, consisting of the fossil shells of diatomacea, ground and mixed with fibre and mucilaginous extract of several vegetable matters. Matthew Keenan, North Bow; Keenan's papier maché, containing ends of hemp rope, hair, charcoal, tar and clay. F. Leroy & Co., London; non-conducting composition, similar to Keenan's composition. Robert Melvor, Birkenhead; adhesive fibrous non-conducting composition, chiefly of clay. Reid, McFarlane & Co., Glasgow; non-conducting incombustible composition, containing clay and hemp refuse. Sutcliffe Brothers, Manchester; Telluric cement, containing flour, rope ends, hemp refuse and clay.

The testing apparatus consisted of two parallel lines of

steam pipe laid on a slope, each pipe supplied with steam of the same pressure and the condensed water was caught in a steam trap at the lower end of the pipe and weighed. The centre pipe was burred during the entire series of tests, one pipe was covered with the Haacke composition and the remaining pipe was covered with the other compositions in succession, each having a six hours' test. The results obtained are shown in the annexed table.

	Steam condensed per cent. of bare pipe.	Thickness of covering, in.	Cost per superficial ft. cents.
Bare pipe	100	—	—
Haacke	23	15-16	12
Eagle	26	14	17
Leroy	29	13	14
Keenan	31	13	18
Keenan	32	13-16	17
Rid M'Farlane	34	11-16	13
R. McVior	37	13	7
Sutcliffe	37	13	7

The amount of steam condensed in the bare pipe varied from 270 lbs. to 441 lbs. during each six hours' test, according to the strength of the wind; the results given by the Haacke covering (15 in. thick) ranging similarly from 75 to 103 lbs. The costs of the different compositions as given include casks, but is exclusive of charges for transport, dressing, finishing or labor.

Electrical Progress.

The London *Electrical Engineer* says that the most prominent branch of electrical engineering, viz., electric lighting, has but a sorry history for 1883. Conflicting opinions exist regarding the future of the electric light, and time alone will prove the correctness of the various conclusions. Badly engineered installations injure beyond conception the progress of the electric light and hinder public confidence. Where success is achieved it is because men who know what they are about have been employed. Has Edison failed at the Houses of Parliament or Swan at the Law Courts? Has Crompton failed at Lord Randolph Churchill's or Brockie at Cannon street railway station, or Brush at Charing Cross railway terminus and in the city streets? It seems, then, that failure is due more to bad workmanship—ignorance, in fact—than to any inherent faults in electric light apparatus. The first real step in the competition with gas for electrical lighting has yet to be made.

A paper by Mr. Preece, a high authority, arrives at conclusions generally in favor of overhead wires. The general utility of overhead wires in country districts is undoubted, but we most emphatically disagree with him as regards overhead wires in large towns. We are but beginning their use, and surely it is bad enough now; but suppose telephone, electric lighting, burglar alarm, fire alarm and other wires to become general—that is, put to every house—fancy the condition. Statistics have been introduced to show the small percentage of accidents. Such statistics are utterly untrustworthy. The data are insufficient. The best proof against Mr. Preece's conclusion is that the Postal Telegraph Department, of which he is chief electrician, after taking over the telegraphs, has not continued the use of overhead wires in London and other large towns.

Another feature of 1883 has been the comparative failure of secondary batteries. The batteries brought before the public with so much *clat* have, to put it mildly, failed. There was no reason to expect them to succeed. They were theoretically and mechanically bad. Better but less known batteries will become more prominent during 1884. A secondary battery is absolutely necessary for the success of incandescent lighting, and although Mr. Edison and those who follow his lead deny this, in one case you get perfect steadiness, in the other steadiness which is not perfect. Quite recently attempt has been made to get up a "boom" in favor of primary batteries.

Telephony has not progressed so rapidly as it ought. Telegraphy, both inland and submarine, shows the best progress of any branch of electrical engineering. The transmission of power electrically is merely talk—the time for work has not yet come.

Accidents on the Intercolonial.

The report of the Minister of Railways gives a detailed return of all the accidents occurring on the road in the 12 months from July 1, 1882, to June 30, 1883, of which the following is a summary:

July	5
August	16
September	9
October	20
November	12
December	8
January	7
February	8
March	6
April	6
May	7
June	3
Total in 12 months	103

Of the persons injured 88 were employés, 5 were passengers and 10 were neither passengers nor employés. The fatal accidents were rather numerous, numbering 23, and resulting in the death of 26 persons.—*St. John (N. B.) Telegraph*.

This includes all accidents causing injury to persons, taking in coupling and other accidents to employés, road-crossing accidents, etc., as well as train accidents.

Accidents on the London Underground Railway. In moving the adoption of the annual report the Chairman of the Metropolitan Railway Co. said that during the past ten years the company had carried 800 millions of passengers without an accident more serious than a fall on the platform or a pinched finger. During those ten years 3,000 deaths had been caused by carriage accidents in the streets of London.

An Accident Which May Have Been Caused by Color Blindness.

A dispatch from Wilmington, Del., Feb. 7, says: "An accident occurred at the Philadelphia, Wilmington & Baltimore Railroad bridge over the Brandywine this morning, which narrowly escaped being a fatal and disastrous one. The bridge was opened by the bridge tender just before the 7:50 north-bound Wilmington express was due, in order to allow the tug 'Claudia' to pass through with a schooner. The signals were set for the expected train, but owing to some reason, perhaps the fog, the engineer did not see them, and when the train turned the curve at Fourth street, going at a tolerably fast rate, the draw was turned off. When the condition of things was discovered the engineer put on brakes and reversed his engine. The bridge tender immediately commenced to turn on the draw, and both men worked with all their strength to prevent a disaster.

The engine could not be entirely stopped and its front wheels had just left the track when the draw was sufficiently turned back to run on the ties, which it did to its full length. The engineer and fireman both kept their places on the engine and did all in their power to prevent it leaving the termination of the main track at the bridge. If the bridge tender had not turned the draw back as soon as he did the engine and several cars would doubtless have plunged into the creek. It took about three-quarters of an hour to get

the engine from the ties on to the bridge track, and the fast south-bound mail due here at 8:15 was in consequence an hour late. The levers and slides of the bridge were badly damaged. The accident occurred at the same point where an engine about three years ago ran through the draw, landing on top of a canal boat, both sinking. It is said that the trouble this morning was due to color blindness of the engineer."

Rigid vs. Flexible Wheel-base.

A correspondent of the *English Mechanic* states that on the Manchester & Derby line (which has many curves) express trains made up of bogie carriages and cars are running with two pounds per ton less resistance than trains of the same weight and the same speed, when made up of four or six-wheeled coaches with a rigid wheel-base of from 15 to 18 ft., the middle pair of wheels having, however, some sideplay. On this road, however, a few years ago, the locomotive superintendent ran some engines with a four-wheel truck against similar engines having a single pair of wheels under the leading end, and finding that both classes burnt the same amount of coal per mile, decided that there was no economy in a truck, and in future built his engines without it. The wear of rails and flanges was apparently left out of consideration.

ANNUAL REPORTS.

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Lehigh Valley	47, 139
Mississippi & Tennessee	8
Missouri Pacific	8
N. Y. & Haven & Hartford	26
N. Y. Ontario & Western	106
N. Y. Pennsylvania & Ohio	10
Pennsylvania & New York	14
Perkio	87
Petersburg	27, 61
Philadelphia & Reading	47
Pittsburgh & Lake Erie	47
Pittsburgh, Ck. & Yough	63
Portland & Ogdensburg	87
Portland & Rochester	107
Providence & Worcester	64
Richmond & Danville	23
Sandy River	87
South Carolina	105
Troy & Greenfield	46
Utica & Black River	87
Western Maryland	87
West Jersey	87
West Va. Central & Pittsburgh	46
Wilmington, Col. & Augusta	8
Wilmington & Weldon	9

Chicago & Alton.

The twenty-first annual report of this company, for the year ending Dec. 31, 1883, gives the following statement of the length of road owned and worked at the close of the year:

	Main track.	Sec'd track.	Side track.	All tracks.
Chicago to Joliet (leased)	37.20	39.30	23.47	100.47
Joliet to East St. L. (owned)	243.50	20.48	70.10	334.08
Coal City branch (owned)	20.76	—	10.17	30.93
Dwight to Washington, and branch to Lacon (owned)	79.80	—	7.16	86.96
Roodhouse to Louisiana (owned)	38.10	—	6.86	44.96
St. Louis, Jacksonville & Chicago (leased)	150.60	—	15.55	166.15
Louisiana & Missouri River (leased)	100.80	—	16.45	117.25
Mexico to Kansas City (leased)	182.62	—	29.01	191.63
Upper Alton line (owned)	7.40	—	—	7.40
Total miles	849.78	60.28	178.77	1,088.83

There was no change in main track worked, but an increase of 0.16 mile in second tracks and of 5.19 miles in sidings, a total of 5.35 miles.

The equipment consists of 228 locomotives; 115 passenger train cars; 3,213 box, 10 refrigerator, 1,848 stock, 1,360 flat and coal, and 97 caboose cars; 16 tool and boarding cars. There are also 19 Pullman sleeping cars in use on the road.

The general account is as follows, condensed:

Preferred stock	\$2,425,400.00
Common stock (including \$72 old scrip)	12,506,472.00
Funded debt	10,762,950.00
Bonds paid and cancelled	888,000.00
Trustees' accounts	50,813.39
Rentals accrued, not yet due	228,717.74
St. Louis, Jacksonville & Chicago	100,182.57
Kansas City, St. Louis & Chicago	483,825.31
Current accounts and balances	1,038,509.49
Income account	1,926,704.06
Total	\$30,339,554.56
Cost of road and equipment	\$23,544,747.32
Machinery and tools	251,640.97
Supplies	392,328.08
Trusts' accounts	100,440.10
Stocks and bonds	289,283.90
Kan. City, S. & L. & Chi. bonds	3,000,000.00
Miss. River Bridge stocks and bonds	499,000.00
Notes receivable	319,151.62
Current accounts and balances	296,877.41
Agents' cash in transit	170,758.01
Cash	1,435,118.55
Total	\$31,339,554.56

The only change in stocks was an increase of \$1,800 in the common stock outstanding.

The funded debt is as follows:

First mortgage 7 per cent. bonds, due Jan. 1, 1893	\$2,383,000
Consolidated 6 per cent. sterling bonds, due July 1, 1903—\$200,000, say	4,379,850
St. Louis, Jacksonville & Chicago bonds, assumed in purchase of road from Roodhouse to Louisiana, first mortgage 7 per cent. maturing April 1, 1894	564,000
Second mortgage 7 per cent. maturing July 1, 1898	188,000
Sinking fund 6 per cent. gold bonds, due May 1, 1903	2,732,000
Louisiana & Missouri River first mortgage 7 per cent. bonds, due Aug. 1, 1900, assumed by the company in settlement of accounts under contract for construction	439,100
Mississippi River Bridge Co. first mortgage sinking fund 6 per cent. bonds, due Oct. 1, 1912, assumed by the company under terms of lease	692,000
Total	\$11,377,950

Since the last report there was a reduction of \$7,000 in first-mortgage bonds and of \$73,000 in the sinking fund gold bonds, and \$1,096,000 income bonds (due Jan. 1, 1888) were paid off, making total reduction of \$1,176,000 in bonded debt.

The earnings for the year were as follows:

	1883.	1882.	Increase.	P. C.
Freight	\$6,197,981	\$5,048,123	\$2,149,858	4.2
Passengers	2,370,379	1,973,101	397,278	15.1
Express	163,119	159,090	4,029	2.5
Mails	128,274	119,817	8,457	7.1
Miscellaneous	61,157	15,364	45,793	233.0
Total	\$8,810,610	\$8,215,495	\$595,115	7.2
Expenses	4,879,938	4,485,881	394,057	8.8
Net earnings	\$3,930,672	\$3,729,614	\$201,058	5.4
Gross earnings per m.	10.306	9.663	700	7.2
Net	4.326	4.389	237	5.4
Per cent. of exps.	55.39	54.60	0.79

Taxes are not included above. If they were the expenses last year would amount to 57.85 per cent. of earnings. Of the operating expenses 52.2 per cent. was paid for labor and personal services; 37.1 per cent. for supplies of various kinds, and 10.7 per cent. for miscellaneous expenses.

The income account was as follows:

By balance Dec. 31, 1882	\$1,859,081.18
By interest on bonds, dividends on stocks owned by our company, and sundry receipts	284,772.82
By gross receipts from traffic	8,810,610.38
Total	\$10,954,464.38
Interest on funded debt	\$700,544.40
Dividends Nos. 40 and 41, paid in March and September	1,194,184.00
Rent paid Joliet & Chicago	106,250.00
Rent paid St. Louis, Jacksonville & Chicago	461,705.50
Rent paid Louisiana & Missouri River	229,643.74
Rent paid Kansas City, St. Louis & Chicago	339,798.00
Rent paid Mississippi River Bridge	70,880.00
Paid for sinking fund bonds purchased from this account for additional property, engines, cars, real estate, new buildings, new tracks, etc.	740,759.06
Excess interest charged La. & Mo. R. Co. in 1882	4,635.02
Paid state, county and municipal taxes	217,074.30
Operating expenses (excluding taxes)	4,879,938.32
Total	9,027,700.32
Balance Dec. 31, 1883	\$1,926,704.06

The dividends paid were 8 per cent. on all stock. The chief items of additional property were the new shop at Bloomington; the purchase of 15 locomotives, 6 passenger, 4 baggage and 500 stock cars; new bridges and the building of 5.45 miles new sidings.

The traffic for the year was as follows:

	1883.	1882.	Inc. or Dec.	P. C.
Car miles	9,119,810	8,202,605	I. 917,145	11.2
Freight cars	60,308,415	63,136,584	I. 6,171,831	9.8
Total	78,428,225	71,339,249	I. 7,088,976	9.9
Passengers carried	1,805,140	1,666,991	I. 138,149	8.3
Passenger-miles	106,028,676	101,150,959	I. 4,877,717	4.8
Tons freight carried	3,488,496	3,522,840	D. 34,344	1.0
Ton-miles	540,369,524	474,823,908	I. 74,545,626	15.7
Av. receipt: Per passenger-mile	2.143 cts.	1.951 cts.	I. 0.190 ct.	9.8
Per ton-mile	1.128	1.261	D. 0.133	10.5

There was a decrease in local and an increase in through freight.

The report does not give the train mileage for last year in its figures.

Of the freight car mileage last year 72,476 per cent. was of loaded cars. The average tonnage for each loaded car was 10,936 tons; for each car, loaded and empty, 7,926 tons.

Of the freight tonnage last year local business furnished 75.03 per cent. The average freight haul was 157.48 miles. The figures given do not include 419,089 tons of freight carried for the company.

Local passengers formed 93.25 per cent. of the whole number carried last year. The average rate per mile for local passengers was 2.399 cents; through, 1.803 cents. The average journey for local passengers was 36.84 miles; for all passengers, 58.73 miles. The average passenger train load was 65,359 miles.

Foreign freight cars last year ran 22,694,421 miles on this road, and Chicago & Alton cars ran 15,035,517 miles on foreign roads.

The President's report says: "Fifteen new locomotives, 6 passenger, 2 baggage, 2 express and 500 freight cars were added to the equipment of your lines during the past year. A new machine shop, 400 by 110 ft., and a new boiler shop, 150 by 110 ft., have been built at Bloomington during the past year, which complete the erection of a system of repair shops at that place, in pursuance of plans heretofore adopted.

"The replacement of iron rails with steel rails of 60 and 70 pounds per yard on all our main lines, including first, second, third and fourth main tracks, had been completed at the date of the last annual report. The company has now tracks with steel and with iron rails as follows:

Miles of track on main lines laid with steel	750.50
Miles of track on branch lines laid with steel	52.63
Miles of track on branch lines laid with iron	96.83
Miles of side tracks laid with iron	152.52
Miles of side tracks laid with steel	290.52
Total	1,088.83

"Five thousand six hundred and nine tons of new steel rails and 339,411 new cross-ties have been laid during the last year.

"Twenty-seven spans of wooden bridges, of an aggregate length of 1,669 ft., have been replaced with bridges of iron, at a cost of \$79,123, during the last year. The aggregate length of all the wooden bridges now remaining on the main lines is about 1,400 ft.

"About 94 miles of road-bed have been ballasted with broken stone, cinders, and gravel during last year.

"The agreement proposed relative to the St. Louis, Jacksonville & Chicago Railroad, as per the terms of a circular addressed to the stockholders of the company, under date of April 10, 1883, is not yet concluded. The written consent of more than three-fourths in interest of each class of the shareholders was given in response to the circular, but it has been considered best that the agreement, if concluded, shall be executed on the part of the St. Louis, Jacksonville & Chicago Railroad Co., in pursuance of authority conferred upon its officers by the shareholders of that company, acting at an annual meeting convened in pursuance of the terms of the charter of that company. Their next annual meeting will be held in April of the present year, when it is expected that they will act upon the proposal which the company has made to them.

"The total gross earnings from farm products shipped at local stations for three years have been as follows:

	Local stations in Illinois.	Local stations in Missouri.	Local stations in Illinois and Missouri.	Per cent. of total gross earnings.
1881	\$799,324.00	\$301,662.00	\$1,100,986.00	19.848
1882	768,813.00	397,424.00	1,166,237.00	19.907
1883	576,792.00	455,039.32	1,031,832.22	16.648

"The foregoing tabular statement shows that from one-fifth to one-sixth of the gross earnings from freight traffic during the last three years has been received for transporting farm products of all kinds shipped at all local stations, and that during the last year the gross earnings from that description of traffic amounted to about one-eighth of the total gross earnings of our lines.

"The acknowledgments of the board are due to the officers

in charge of the several departments, and those employed under their directions, for the efficiency, zeal and fidelity manifested in the discharge of their duties during the past year."

Lehigh Coal & Navigation Co.

This company owns a great coal property in the Lehigh and Wyoming anthracite regions; it owns the Lehigh Canal from Mauch Chunk, Pa. to Easton, and leases the Delaware Division Canal from Easton to Bristol. It also owns the Lehigh & Susquehanna road from Easton to Wilkesbarre, 105 miles, with 50 miles of short branches, and leases the Lehigh & Lackawanna, 25 miles; the Nesquehoning Valley road, 17.5, and the Trescow road, 6.5 miles. These railroads, 204 miles in all, were leased to the Central Railroad Co. of New Jersey, and are now leased, with that road, to the Philadelphia & Reading Co. The figures below are from the report of the managers for the year ending Dec. 31.

The income account for the year is as follows:

	1883.	1882.
Railroads and Nesquehoning Tunnel.....	\$1,614,985	\$1,445,190
Lehigh Canal and water power.....	86,433	76,784
Delaware Div. Canal.....	57,745	47,586
Net profit on Lehigh coal.....	386,354	325,667
Royalty, rents, etc.....	49,262	44,005
Total receipts.....	\$2,104,489	\$1,939,212
General and legal expenses.....	65,064	62,892
Rent and taxes, Nesquehoning Valley Railroad.....	97,010	97,050
" " Del. Div. Canal.....	81,438	102,356
Taxes.....	71,918	74,648
Interest account.....	934,377	942,973
Total expenses.....	\$1,249,845	\$1,279,919
Net receipts.....	\$854,644	\$659,293

The gross receipts of the company's railroads were as follows:

	1883.	1882.	Increase.	P. c.
Passengers and mails.....	\$224,777	\$183,695	\$41,082	22.2
Freight and express.....	682,565	646,887	35,678	5.5
Coal.....	3,868,443	3,464,460	403,983	11.7
Total.....	\$4,775,785	\$4,295,062	\$480,723	11.2
This Co.'s proportion.....	1,591,028	1,431,687	159,341	11.2

The disposition of the net receipts shown above was as follows:

Net earnings.....	\$854,644.08
Less sinking fund of 10 cents per ton on 920,318 tons.....	\$92,081.80
Less depreciation on coal improvements.....	97,157.45
Surplus for year.....	189,239.25
Dividends, 5½ per cent.....	624,928.00
Balance.....	\$130,476.83

Two dividends were paid, one of 2½ per cent. on 225,338 shares, and one of 3 per cent. on 228,837 shares.

The coal tonnage of the Lehigh Canal and the railroads was as follows:

	1883.	1882.
Delivered east of Mauch Chunk by rail.....	4,305,167	3,934,213
Delivered east of Mauch Chunk by canal.....	429,285	369,003
Consumed along the line above Mauch Chunk.....	137,034	128,605
Delivered to Lehigh Valley Railroad at Packer-ton.....	6	59
Delivered to connecting lines above Mauch Chunk.....	280,726	233,801
Total.....	5,152,218	4,665,851

The total increase was 486,367 tons or 10.9 per cent. The coal in 1883 came from the following sources: Wyoming Region, 2,801,999; Upper Lehigh Region, Nesquehoning Branch, 572,502; Hazleton, 49,840; Black Creek, Drifton Branch, 373,611; Beaver Meadow and Mahanoy, 600,483; Mauch Chunk, 907,126; Schuylkill Region, 46,657; total, 5,152,218 tons. The company's Lehigh coal lands produced 920,318 tons of coal, an increase of 70,927 tons over the production of the previous year, which was itself in excess of any earlier year.

There was no serious interruption to canal navigation, and the open season was the longest for a number of years. The coal tonnage of the canal shows an increase of 61,357 tons, or 10 per cent.

The claim of the state of Pennsylvania under the four-mill tax law has been finally decided by the Supreme Court in favor of the company.

The conversion of the Delaware Division Canal stock into this company's stock has continued, and there are now only 8,800 shares, about 27 per cent of the whole issue, outstanding. The first installment of Delaware Division scrip matured and was paid during the year.

The floating debt was reduced \$60,000 out of earnings, and the balance has been so placed that it can be carried at a low rate of interest. There has been a steady reduction of fixed charges for the past five years.

The report says: "The reduction on the interest on the first mortgage loan was accomplished in connection with its extension at par from April 1, 1884, to July 1, 1914, and a reduction of the principal from \$5,381,841 to \$5,000,000, the remainder being reserved for payment into the sinking fund provided for this loan in the mortgage for April 1, 1864."

"In the spring of 1883 the Philadelphia & Reading Railroad Co. proposed to lease all the railroads owned or controlled by the Central Railroad Co. of New Jersey. As the interests of the former corporation were to some extent competitive with ours we thought it necessary to have proper guarantees that our interest should be protected before giving our consent to the proposed lease. The negotiations to secure this end resulted in an agreement, under date of May 29, 1883, between the two companies just named and this company, which provides that the Philadelphia & Reading Railroad Co. shall assume and become responsible for all the undertakings of the Central Railroad Co. of New Jersey under the original lease of March 31, 1871; that it shall carry all other contracts of the latter company in which this company may have an equitable interest; shall properly develop the business of the Lehigh & Susquehanna Railroad and branches; shall increase the productiveness of the coal lands of the Lehigh & Wilkesbarre Coal Co., so that they shall continue to ship about 40 per cent. as much coal as shall be shipped from year to year from the lands of the Philadelphia & Reading Coal & Iron Co.; shall send the product of the first-mentioned lands to market over the lines of the Lehigh & Susquehanna Railroad and branches, and shall give this company, for any coal lands that it may own or control, transportation rates as favorable as those that may be given by it from time to time to any other shipper of anthracite. The agreement further provides that the rental of the Lehigh & Susquehanna Railroad and branches shall never in any year be less than \$1,414,400, we agreeing not to demand as part of the rental in any year prior to Dec. 31, 1887, any excess which one-third of the gross revenues of the railroads may produce over \$1,725,700, nor in any year thereafter, and prior to Dec. 31, 1892, any similar excess over \$1,885,000, nor in any year after the last-named date any similar excess over

\$2,043,000, except that to each of these maximum yearly rentals shall be added interest at the rate of 7 per cent. on all construction work on the said railroads, which may, subsequent to Dec. 31, 1883, be charged to our construction account under the provisions of the original agreement of March 31, 1871. The power is reserved to this company to declare the agreement of March 31, 1871, and the agreement of May 29, 1883, terminated upon any breach of covenant by either of the other parties thereto, if the same shall not be fully compensated within a reasonable time, and to repossess ourselves of all our original rights as if neither agreement had ever been made.

"This agreement secures to us at all times a good revenue from our railroads, as the minimum payment to be made under it will be nearly as great as the greatest amount ever paid by the Central Railroad of New Jersey, and \$165,000 greater than the total disbursements last year for general expenses, rentals, interest and taxes.

"The clause about the development of the coal estate of the Lehigh & Wilkesbarre Coal Co. secures a steady increase of production from these lands, which have for several years past shipped one-half of the total coal tonnage of our railroads, and requires that it shall all go to Eastern markets over our roads.

"The managers congratulate the stockholders on the general result of the business of 1883, which shows larger net earnings than any previous year of the company's history. Every department of the property is in excellent condition, and there is reason to expect still greater revenues during the present year.

"Steadily increasing earnings and steadily decreasing charges against revenue have brought us into a position where the stockholders should feel confident of their returns, so long as any similar property in the state can do a remunerative business. Our coal estate, which, next to the railroads, is the most considerable source of our revenue, has at last reached a development commensurate with its magnitude; and as in the worst years of the late depression of the coal trade our coal never yielded less profit than 27 cents per ton, we may reasonably expect it to continue to show good results; and our canals, by reason of the large tonnage we can give them and their favorable physical characteristics of descending grades in favor of the heavy tonnage and an abundant supply of water, have proved themselves able to compete profitably with railroads, notwithstanding the great cheapening of rail transportation.

"It is worthy of note, as bearing on the value of coal lands, that Mr. Charles A. Ashburner, the Geologist in charge of the anthracite survey, a department of the State Geological Survey, in an official report just published gives the following estimates as the result of a most thorough and painstaking examination of our Summit lands, which has extended over several years. This property originally contained about 1,035,000,000 tons of merchantable coal, of which amount about 941,000,000 tons, or 91 per cent., remains untouched. That portion of the property which has been partially worked, which originally contained 92,000,000 tons of coal, has produced 24,800,000 tons, and will produce 6,600,000 tons more before it is exhausted, showing a production of marketable coal equal to 34 per cent. of the original contents.

"From these data it will be seen that the unworked portion of our coal estate is capable of producing a very large tonnage for very many years."

St. Paul & Duluth.

This company owns a line from St. Paul, Minn., to Duluth, 156 miles, with branches from White Bear to Minneapolis, 14 miles, and from Knife Falls Junction to Cloquet, 6 miles. It leases, and practically owns, the Stillwater & St. Paul, 13 miles, and a branch from Wyoming to Taylor's Falls, 31 miles, making 210 miles worked last year. A new branch, from Rush City, Minn., to Grantsburg, Wis., 17 miles, was completed just at the close of the year, making the mileage for the current year 227 miles. The main line for 24 miles from Duluth is owned and used in common with the Northern Pacific. The following statements are for the year ending Dec. 31 last.

The general account is as follows:

Preferred stock.....	\$5,036,767.60
Common stock.....	4,055,407.51
First mortgage 5 per cent bonds.....	1,000,000.00
Equipment trust.....	22,181.14
Accounts and balances.....	458,016.72
February dividend.....	175,413.00
Deferred land income.....	405,547.85
Income account, balance.....	446,528.66
Total.....	\$11,599,862.48
Road and equipment.....	\$10,120,880.70
Branch lines.....	505,134.88
Bills receivable and land contracts.....	405,547.85
Supplies.....	161,204.46
Bills, accounts and balances.....	28,257.41
February dividend, cash.....	175,413.00
Cash.....	203,424.18
Total.....	\$11,599,862.48

The land grant is not included among the assets. The company has 1,206,867 acres of land remaining unsold. The equipment trust has all been paid off except the small balance noted above, and the last payment will be made May 1 next, when the equipment held under the trust becomes the property of the company.

The earnings for the year were as follows:

	1883.	1882.	Increase.	P. c.
Earnings.....	1,328,528	\$1,109,840	\$218,688	19.7
Expenses.....	962,979	798,594	164,385	20.5
Net earnings.....	\$365,549	\$311,246	\$54,303	17.5
Gross earn. per mile.....	6,326	5,692	634	11.9
Net ".....	1,741	1,538	203	9.6
Per cent. of exps.....	72.5	72.0	0.5	

The increase in both gross and net earnings was very considerable.

The income account was as follows:

Net earnings.....	\$365,548.84
Land sales and stumpage.....	220,238.46
Total.....	\$585,787.30
Interest on bonds.....	\$50,000.00
Equipment trust.....	44,362.28
Dividends on preferred stock, 7 per cent.....	350,731.50
Total.....	445,093.78
Balance, surplus for the year.....	\$140,693.52
Surplus Jan. 1, 1883.....	286,064.30
Surplus Jan. 1, 1884.....	\$427,357.82

Of this balance \$309,651.27 remains on hand in income account, and the remaining \$117,706.55 represents \$122,000 preferred stock received for lands and canceled.

During 1883 the work of relaying the main track throughout with steel rails was completed; the entire branch to Taylor's Falls, 21 miles, was purchased (an undivided half being previously owned); a branch to Grantsburg, 17 miles, was built, which was opened for business in January, 1884, making the present mileage operated 227 miles, and the sum of \$133,718.60 was expended for improvement, construction and equipment.

New York, Susquehanna & Western.

During the last fiscal year, ending Dec. 31, 1883, this company owned and worked the following lines:

	Miles.
West End, Jersey City, N. J., to Unionville, N. Y.....	71.60
Two Bridges, Sussex County, N. J., to Gravel Place, Pa.....	50.10
Columbia Junction, N. J., to Delaware.....	3.10
Paterson Extension Branch.....	9.75
Pricville to Winton—branch in Lackawanna Valley, Pa.....	5.50
Total owned.....	131.0
Unionville, N. Y., to Middletown (leased).....	1.90
Lodi Branch (leased).....	2.00
Total operated.....	146.05

From West End to Jersey City and New York the company uses the tracks, stations and ferries of the Pennsylvania Railroad. The company makes the following statements of its operations for 1883.

The earnings for the year were as follows:

	1883.	1882.	Inc. or Dec.	P. c.
Freight.....	\$736,531	\$501,050	I. \$235,472	47.1
Passengers.....	223,194	187,442	I. 35,752	19.1
Mail, etc.....	78,931	37,457	I. 41,474	110.6
Total.....	\$1,038,656	\$725,958	I. \$312,698	43.1
Expenses.....	638,591	478,092	I. 160,589	33.6
Net earnings.....	\$400,065	\$247,956	I. \$152,109	61.3
Gross earn. per mile.....	7.066	7.360	D. 194	2.5
Net earn. per mile.....	2.732	2.480	I. 252	9.7
P. c. of exps.....	61.48	65.84	D. 4.36	

The earnings for 1883 were on the full mileage of 147 miles; for 1882 they were on an average of about 100 miles.

The result of the year was as follows:

Net earnings, as above.....	\$400,064.55
Interest on bonded debt.....	\$400,500
Less interest on Midland of N. J. bonds held by the company.....	18,000
Surplus over fixed charges for the year.....	\$17,564.55

The coal carried over the road for the month of January, 1883, was only 8,409 tons, but in October 39,633 tons. During December the company worked half time, producing 26,964 tons. The total coal tonnage for the year was 329,522 tons, and the average total per month was 27,460 tons. Arrangements are now being made which will, it is expected, increase the coal tonnage by April next to 3,000 tons a day.

New Haven & Northampton.

This company owns a line from New Haven, Conn., to Conway Junction, Mass., 94½ miles, and its trains use the Troy & Greenfield track from Conway Junction to North Adams, 28½ miles. It owns branches from Farmington, Conn., to New Hartford, 14 miles; from Northampton, Mass., to Williamsburg, 7½ miles, and from South Deerfield, Mass., to Turner's Falls, 10 miles. It leases the Holyoke & Westfield road, from Westfield, Mass., to Holyoke, 14½ miles; making a total of 126 miles owned and 169 miles worked. The report is for the year ending Sept. 30.

A controlling interest in the stock is now owned by the New York, New Haven & Hartford Co., but the road is worked under its separate organization.

The general account is as follows, condensed:

Stock.....	\$2,460,000.00
Bonds.....	3,300,000.00
Bills payable.....	630,000.00
Accounts and balances.....	149,562.07
Income account.....	382,920.32
Total.....	\$6,822,482.39
Road and equipment.....	\$6,509,634.72
Hol. & West. stock and bonds.....	80,000.00
Real estate account.....	17,372.81
Sinking fund.....	67,500.00
Materials.....	95,948.32
Cash and cash assets.....	52,026.54
Total.....	\$6,822,482.39

The funded debt consists of \$1,300,000 first-mortgage 7 per cent. bonds, \$1,200,000 consolidated 6 per cent. bonds, and \$700,000 Northern Extension 5 per cent. bonds, the yearly interest charged being \$198,000.

The traffic for the year was as follows:

	1882-83.	1881-82.	Inc. or Dec.	P. c.
Train miles.....	674,984	683,392	D. 8,398	1.2
Passengers carried.....	503,431	483,229	I. 20,202	4.2
Passenger-miles.....	9,052,589	8,726,851	I. 325,838	3.7
Tons freight carried.....	475,634	498,671	D. 23,037	4.6
Ton-miles.....	25,328,564	24,800,865	I. 527,699	2.1
Average rates:				
Per passenger-mile.....	2.36 cts.	2.30 cts.	I. 0.06 cts.	2.6
Per ton-mile.....	2.35 "	2.63 "	D. 0.28 "	10.6

There was a small increase in passenger traffic, and also a small increase in freight traffic, the latter accompanied by a considerable decrease in rates. The average passenger journey last year was 17.98 miles; the average freight haul 53.25 miles.

The earnings for the year were as follows:

	1882-83.	1881-82.	Inc. or Dec.	P. c.
Freight trains.....	\$398,777	\$651,894	D. \$253,117	8.1
Passenger trains.....	238,148	225,442	I. 12,706	5.6
Wharfage, rents, etc.....	23,123	18,965	I. 4,158	22.0
Total.....	\$660,048	\$896,271	D. \$236,223	4.0
Expenses.....	564,788	564,784	I. 2,004	0.4
Net earnings.....	\$95,260	\$331,487	D. \$236,227	11.5
Gross earn. per mile.....	5.093	5.303	D. 214	4.0
Net ".....	1.747	1.973	D. 226	11.5
Per cent. of exps.....	65.67	62.79	I. 2.88	

There was a small decrease in earnings, and a slight increase in expenses, which include all improvements of the road and equipment made.

The income account is as follows, condensed:

Net earnings, as above.....	\$295,260.14
Balance, Oct. 1, 1882.....	19,864.90
Interest and dividends on Holyoke & Westfield.....	4,400.00
Increase in bills payable.....	45,000.00
Increase in accounts and balances due.....	58,632.85
Total.....	\$423,157.98

Interest on bonds.....	\$198,000.00
Floating debt.....	38,925.05
Rental Holyoke & Westfield road.....	29,068.54
Construction account.....	47,283.63
Sinking fund.....	15,000.00
Taxes.....	30,082.23
Increase of materials on hand.....	12,088.90
Balance, cash and cash assets, Sept. 30, 1883.....	\$52,026.54

During the year 5,150 ft. of sidings were laid at various points on the road and other important improvements were made.

The report says: "There has been expended on the Northern Extension during the year \$47,284, making the total cost to Sept. 30, 1883, \$1,433,027; business on this portion of the road is rapidly increasing and there is every reason to believe the expenditure will prove a judicious one for the interests of the company."



Published Every Friday.

EDITORIAL ANNOUNCEMENTS.

Passes.—All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.

Addresses.—Business letters should be addressed and drafts made payable to THE RAILROAD GAZETTE. Communications for the attention of the Editors should be addressed EDITOR RAILROAD GAZETTE.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

MR. VANDERBILT AND THE ROCK ISLAND MANAGEMENT.

There have been several interviews with Mr. W. H. Vanderbilt on one side and with Mr. Cable, President of the Rock Island Company, on the other, reported in the New York papers recently. Mr. Vanderbilt complains that he, being the largest stockholder, yet owning only 12,000 out of the whole 500,000 shares, is not allowed representatives in the Rock Island board, and on its Executive Committee, and says that he proposed Mr. Keep, President, and Mr. Hughitt, Second Vice-President of the Northwestern for seats in the board. He apparently has no definite charge to make against the present management, except that it causes unnecessary trouble with other roads, but say he "wants to know" more about the conduct of the property in which he is interested. This is a reasonable and laudable desire, but it is one that may properly be cherished by owners of as few as 100 or 10 shares of Rock Island stock, and not of Rock Island only, but of New York Central, Lake Shore, Northwestern and other railroad companies. These holders have precisely the same rights as Mr. Vanderbilt to know how their business—for it is their business as well as the directors and president's business—is conducted, and how it is turning out; and in very few cases indeed do they get anything like satisfactory information oftener than once a year, and in very many instances not then. If it is argued, as it may be with much force, that a certain degree of secrecy is necessary in a competitive business when rivals practice it and that therefore it will not do to let all the stockholders know what is going on, then big holders as well as little ones must take the consequences, one of which is that they do not know that the value of their property has changed until long after the change has taken place. It is entirely appropriate that the disadvantages of this ignorance should be strongly impressed upon a large holder like Mr. Vanderbilt, who is able to dictate how much information shall or shall not be given to shareholders, large and small, who have no personal representatives in certain other companies. He will learn to "know how it is himself."

It is an extremely delicate thing to decide how far different railroads may have the same management, especially when their lines are in the same general field. But when two companies actually compete for the same business, and are likely to have conflicting interests that will result in opposite policies, it must often be almost impossible for one man to serve actively in the two boards. For instance, a few years ago the Northwestern took steps to lease the Burlington, Cedar Rapids & Northern, which the Rock Island did not wish it to control. It might have been important for the Northwestern to conceal its designs until they were all ready for execution; and in that case a director serving in both boards could not do his duty to both companies. Frequently a company will design the construction of a

branch in a district where a competitor would occupy the ground beforehand if it knew of this intention. In a word, no man can serve two masters who have conflicting interests. It is indispensable that a settlement of the conflicts be made before he can serve both fully. It is true that there are many cases where one man is a director in two or more companies which compete sharply, but it is also true that a railroad director often has not much more to do with the direction of his company than another man, and the plans of the majority may be carefully concealed from him. At present one of the Milwaukee & St. Paul directors is in the Chicago, Burlington & Quincy board. It has been reported that the last-named company purposes building a line to St. Paul. If it were important to conceal this purpose from the St. Paul Company as long as possible, as it might be, probably the St. Paul director would not be informed of the plan until the last moment. It is perhaps partly for this reason that in so many cases virtually the whole administration of a railroad company is left to the Executive Committee of the board, while directors representing various "interests" are little consulted, but have access to reports of expenses and financial details which are not published—that is, get about that information to which all stockholders are fairly entitled.

It may very well be possible to make an agreement between the Rock Island and the Northwestern companies which will make it practicable for the same men to take part in the management of both companies, but if they are to continue active competitors, each on occasions trying to get the advantage of the other, it is hard to see how this will be possible—how a man can fairly hold a command in two opposing armies.

It is true that this has been attempted many times, and in the companies now most concerned. Perhaps most people have been forgotten that in 1860 Mr. Alexander Mitchell, then as now President of the Milwaukee & St. Paul, was made President of the Chicago & Northwestern also, and that a large minority of the Northwestern board were also in the St. Paul board. It is more generally remembered that in 1870 Mr. John F. Tracy, who was then and had long been President of the Rock Island Company, was made President of the Northwestern also, and exercised his authority very decidedly, generally acting through the same Mr. H. H. Porter whom Mr. Vanderbilt now finds so disagreeable. We cannot say that the Northwestern suffered from the change, but it certainly was not allowed to hurt the Rock Island unduly, and in one instance a competition with the Rock Island which it had designed was abandoned. The Rockford, Rock Island & St. Louis had then recently been opened from the Northwestern at Sterling to Rock Island, forming a route 162 miles long from Chicago to Rock Island, against 181 by the Chicago, Rock Island & Pacific. Arrangements had been made between the Northwestern and the Rockford companies to run through passenger trains between Chicago and Rock Island, and this was advertised; but Mr. Tracy came in about the time the trains were to be put on, and nothing more was heard of them. Mr. Tracy was President of the Northwestern for three years.

It is of course intolerable that men should be put into the board of a railroad company in order to manage it in the interest of some other company in which they or their principals have a larger interest. This would make them use the property of one set of men for the benefit of another set of men. Doubtless no one would venture to propose anything of the kind openly, though the thing has been done—as so many other things in railroad administration have been done that ought never to have been done. Doubtless Mr. Vanderbilt's idea in proposing to have Northwestern directors in the Rock Island board is to prevent costly disagreements and hostilities between the two companies—costly to the Rock Island as well as to the Northwestern. But it is only their costliness to the Rock Island which will justify removing them by a change in the Rock Island board. Let us say that the Rock Island's policy in making a line to St. Paul and Minneapolis, with the accompanying competition in rates, has caused the Northwestern and the Milwaukee & St. Paul to lose half a million of net profits apiece. That is very disagreeable to them and to their stockholders, but it does not concern the stockholders of the Rock Island in the least, except so far as it affects or is likely at some time to affect the profits of their own company. If the final result, taking everything into consideration, is an addition of \$100,000 to their profits, they will look with indifference on the loss of a million by the other two companies, and will commend the directors who established the line, not dismiss them.

But it is important to take everything into consideration. If the new line to St. Paul by which the Rock Island netted a profit of a certain sum caused the construction of a new line to Council Bluffs by the St. Paul, which took from the Rock Island two or three times as much, or the construction of branches and other competition by which it lost or will eventually lose more than it gains by the St. Paul line, then that line, or the method of conducting it, has been disadvantageous to the Rock Island Company as well as to its competitors. In a word, if the management of the Rock Island Company is such as to cause the antagonism of its competitors to such a degree that in the long run it loses more than it gains by its policy of extensions and competition and methods of competition, then a change of management is desirable in the interest of the Rock Island Company.

Now that is entirely possible. Judging by what is said, since Mr. Riddle retired from the presidency of the Rock Island the railroads which have relations with that company have had great difficulty in getting along with it, and many claim that it insists on a policy which tends to destroy profits for everybody and can but result in material injury to railroad interests, its own included, in the long run. It is not easy to submit these complaints to analysis and pass judgment upon them, because the facts complained of are mostly matters which are not made public. We may be told that this or that traffic has been ruined, but we have no means of knowing how great the value of that traffic was, and how much the different lines lost. And in the nature of things we often cannot say positively what it was that occasioned certain well-known facts. Such and such a line would not have been built, such a harmful policy would not have been begun, we may say; if this unreasonable manager had not been so aggressive. This may be so, but we cannot prove it. The best we can do is to judge from the impression made upon the great mass of sober-minded and fair-minded persons who are engaged in the business concerning which the complaints arise. If there is anywhere a manager who is likely to cause a chronic railroad war, or even chronic railroad skirmishing, he is likely to prove costly to his own shareholders, and it will be no comfort to them if he has been much more so to other companies. It is for this reason that a company needs to pay attention to the complaints of its competitors.

It seems possible that Mr. Vanderbilt will endeavor to have a change made in the directory of the Rock Island board, not by purchasing a controlling interest, which would be very costly even for Mr. Vanderbilt to do, but by appealing to the other stockholders. This is the proper way to do, and often practiced in England, where any stockholder may at any time examine and have a copy of the list of shareholders and their addresses, and where the companies are by law compelled to print this list once a year and sell copies to share and bondholders for not more than five shillings. It would be something of a novelty in this country, but a very desirable one, if there should be an open or honorable contest for a change in the management of a company in which each shareholder should be addressed with a statement of the reasons why a change should or should not be made. But it will not be enough for Mr. Vanderbilt to say, "I don't like Mr. Cable and Mr. Porter. Send me your proxies, and I will put in somebody whom I do like." If he will issue a statement to the stockholders pointing out particular things that the Rock Island management has done or neglected to do, for which he condemns it, and giving his reasons why he thinks the policy followed is harmful to the best and permanent interests of the Rock Island Company, and suggest persons for directors who will work for its best and permanent interests, and whose position will enable them to do so, he will certainly secure an attentive hearing and, perhaps, be the means of introducing a great reform in corporation administration.

UNION PACIFIC EARNINGS.

The Union Pacific reports a moderate decrease in gross earnings in December, but a truly enormous one in net earnings, the figures being:

	1883.	1882.	Inc or Dec.	P.c.
Gross earnings..	\$2,407,215	\$2,559,005	— \$151,790	6.0
Expenses.....	1,730,889	1,365,223	+ 365,666	26.7
Net earnings...	\$676,326	\$1,193,782	— \$517,456	43.4

Thus with a decrease of nearly 6 per cent. in gross earnings the net earnings have fallen off more than 43 per cent., because of a great increase in working expenses, which were 71½ per cent. of the earnings last December and only 52½ in 1882, and, it may be added, only 59½ per cent. for the whole year 1883. The expenses of this road fluctuate in an extraordinary manner from month to month; but the change in Decem-

ber, as compared with the previous month, was not much in expenses, but chiefly in earnings, as the following statement of earnings and expenses in successive months will show:

1883:	Gross earnings.	Expenses. Amount.	P. c. of earnings.	Net earnings.
Six mos. to June 30.	\$13,412,960	\$7,167,348	53.4	\$6,245,712
July	\$2,507,866	\$1,341,877	53.3	\$1,225,989
August	2,576,446	1,456,468	56.9	1,119,978
September	2,984,076	1,555,188	51.3	1,428,888
October	3,080,406	1,720,443	56.2	1,359,963
November	2,731,722	1,708,884	62.6	1,022,838
December	2,407,215	1,730,889	71.9	676,326
Six mos. to Dec. 31.	\$16,348,034	\$9,502,923	58.1	\$6,845,111
Year 1883	29,760,994	16,670,171	56.1	13,090,823
1882:				
Six mos. to June 30.	\$13,780,224	\$7,821,168	56.6	\$5,978,056
July	\$2,205,054	\$1,220,049	55.3	\$985,005
August	2,827,904	1,220,495	43.2	1,607,409
September	3,170,315	1,280,592	39.8	1,889,723
October	3,109,506	1,562,564	48.5	1,546,942
November	2,711,916	1,690,861	62.4	1,021,055
December	2,559,005	1,365,223	53.3	1,193,782
Six mos. to Dec. 31.	\$16,583,703	\$8,259,784	49.6	\$8,323,919
Year 1882	30,363,927	16,061,950	52.9	14,301,977

The earnings last December were \$160,000 less than last June, but the expenses were \$389,000 larger in December, and were \$195,000 larger than in September, when the earnings were \$587,000 larger than in December. But in 1882 the expenses were very much (\$325,000) less in December than in November, while in 1882 they were little larger in December. As has been the case in some other months, therefore, the great increase in expenses in December seems to be because they were unduly small in 1882, rather than because they were unduly large in 1883.

There seems to have been an unusual course of expenses in the last half of 1882. They were then only 48½ per cent. of the earnings, while in the first half of that year they were more than 50½. The contrary has been the course in 1883, when the expenses were 53½ per cent. in the first half and rose to 58 per cent. in the last half of the year.

At the end of the first half of last year the gross earnings were but \$367,264 (2½ per cent.) less than last year, and the working expenses had been reduced \$634,918 (8½ per cent.), so that there was an increase of \$267,654 in net earnings; but in the last half of the year, with a decrease of \$235,669 (1½ per cent.) in gross earnings, there has been an increase of no less than \$1,243,139 (15 per cent.) in the working expenses, so that there is a decrease in net earnings in the last half amounting to \$1,478,808, or 17½ per cent., which transforms the increase in the first half to a decrease of net earnings for the whole year amounting to \$1,211,154 (8½ per cent.), a decrease which amounts to \$1.99 per share of Union Pacific stock. In the five months since July the decrease has been \$1,719,732, or \$2.82 per share, which is a remarkable change to take place in so short a period at a time when most of circumstances affecting traffic of which we have trace, and especially the crops of Kansas and Nebraska, have been decidedly favorable. But we have seen that the decrease in gross earnings in either half of the year was not considerable, and the great change in net earnings is due almost entirely to the increase in expenses. It is not impossible that there has been a considerable increase in the traffic carried, which would naturally increase expenses, and, taken at lower rates, would not increase earnings. So far as transcontinental, Utah and Colorado traffic are concerned, however, the indications are that the amount going over the Union Pacific did not increase but decreased last year, there being more and more successful competition by other roads.

The earnings and expenses here given are those for the whole Union Pacific system, of which an average of 3,895 miles were worked in 1882, and from 4,182 to 4,580 miles—an average probably of 4,400 miles—in 1883. This makes a decrease in gross earnings per mile from \$7,795 to \$6,586, and in net earnings from \$3,672 to \$3,250; the decrease in the latter being 11½ per cent. The net earnings per mile last year are by no means small, however, but much above the average of railroads in the United States, which by the last census was \$2,623 per mile. In 1881 an average of 3,460 miles worked by this company earned \$29,776,895 gross, and \$13,354,115 net.

Only 1,821 miles of this vast system are owned directly by the Union Pacific Railway Company, while the remainder is controlled by the ownership of a majority of the stock or leased by that company. Its investments in the securities of these other companies at the end of 1882 were about \$37,000,000. Then \$12,096,835 of the net earnings were made on these 1,821 miles of road—only \$2,205,142 on the other roads worked, whose average length for the year was 2,074 miles. Many of these were but just opened in 1882, and on five the expenses were larger than the gross earnings. It is said that all but one of these leased lines made some net earnings in 1883, but if, as was to

be expected, there was an increase in the net earnings of these lines, there must have been a very large decrease on the system owned, which consists substantially of the original Union Pacific (Council Bluffs to Ogden), the Kansas Pacific (Kansas City and Leavenworth to Denver), and the Denver Pacific (Denver to Cheyenne). This system earned net no less than \$6,656 per mile, which is a very large amount for railroads through a country so thinly peopled as most of that on the Union Pacific. The Chicago, Burlington & Quincy, which has 1,281 miles of railroad west of the Missouri, and whose larger system east of that river is in a much more populous country than any on the Union Pacific, earned net last year \$4,120 per mile, and in 1882 \$3,510; the Chicago & Northwestern, \$3,642. These latter roads have a capital account very much lighter than that of the Union Pacific; the cost of whose 1,821 miles of road is charged as \$157,000,000, or \$86,225.

By far the greater part of the road is over country where railroads can now be easily and cheaply constructed. From the proceeds of \$30,000 or less of 4 per cent. bonds—that is, for a yearly interest charge of \$1,200, the Chicago, Burlington & Quincy or the Northwestern can build railroads as far west as the mountains, and the Burlington has built many already in the territory adjacent to the Union Pacific. At a little higher cost it will be possible to extend this or the Sioux City & Pacific over the Rocky Mountains to Ogden. It is the necessity of competing with cheap railroads like these that makes the position of the Union Pacific a delicate one, and renders it extremely uncertain that it can continue to earn \$6,000 or \$7,000 net per mile on its main lines. Roads that will be fairly supported with \$1,500 to \$2,500 are built north of it and south of it, and are likely to be extended as long as they can get such support, and divert some traffic from the Union Pacific, and reduce the rates which it is possible to get on more. This competition is comparatively a new thing for the Union Pacific. It would injure it far more than it does were it not for the extended system of branches which that company has constructed of late years. These do not prevent the reduction in rates by the competition of cheap roads, but greatly restrict the diversion of traffic by them.

And it seems quite probable that the roads which are already extended so far west along the line of the Union Pacific will still further extend them. The Burlington now has a line from Chicago to Denver, 1,058 miles, and until within 50 miles or so of Denver the line is within 70 miles of the Union Pacific main line. Now any traffic that the Burlington may secure west of the Missouri is worth more to it than to the Union Pacific, because it not only gets the haul for the 500 miles west of the Missouri River, but for traffic which goes to Chicago or St. Louis it gets, in addition, a haul for a nearly equal distance east of the Missouri.

A branch up a valley 50 miles, costing \$1,000 a mile a year, we may say may give traffic which will yield but \$10,000 profit on that branch, but will yield \$30,000 more to a railroad connecting it with Omaha, and \$15,000 more to one connecting it with Chicago. Now such a road costing \$50,000 a year, will give the Burlington \$55,000, but the Union Pacific only \$40,000 a year. Under the old arrangement, by which the Union Pacific traffic was divided among three railroads east of the Missouri, the Burlington had not so great a temptation to build the road, because if built by the Union Pacific it would get one-third of the profits on its traffic east of the Missouri; but when it is cut off from interchange with the Union Pacific it has its whole thousand miles of railroad impelling it to build feeders to secure traffic wherever there is any. If the Union Pacific will not bring any of the traffic to it, it is likely to go itself and get it. And the temptation is increased so long as the rate received west of the Missouri is higher than that east of it, and this is true, whether it shares the Union Pacific traffic or not. In any event it is more desirable to get traffic for 1,000 than for 500 miles of main line; but where the profit is twice as great on the Western as on the Eastern 500 miles, a much greater outlay is justified to secure through traffic for the Western than for the Eastern Division. The natural result of this will be eventually a reduction of rates where they are much above those of the lines east of the Missouri.

Chicago & Northwestern Net Earnings.

The *Commercial and Financial Chronicle* publishes a statement of the working expenses of the Chicago & Northwestern Railway for the seven months of the fiscal year ending with December last, of which it says, "while the figures do not come through the company's office they are nevertheless trustworthy and exact." According to this statement the gross and net earn-

ings and working expenses for the seven months have been:

	1883.	1882.	Inc. or Dec.	P. c.
Gross earnings	\$16,348,171	\$15,401,945	+\$946,226	6.1
Expenses	9,122,367	8,143,999	+ 978,368	12.0
Net earnings	\$7,225,804	\$7,257,946	- \$32,142	0.5

Thus the considerable increase in gross earnings was absorbed, and a little more, by the larger increase in working expenses, so that the net earnings were even a trifle less in 1883 than in 1882, the per cent age of expenses having been 55.8 per cent. in 1883, against 52.9 in 1882, and we may add 47.4 per cent. in 1881. The mileage worked was about 3,750 miles in 1883, against 3,350 in 1882 and 2,900 in 1881. Thus the increase in mileage, though it has added something (but not much), to gross earnings, has not caused an increase in net earnings. We shall see this better by comparing the results of the seven months of 1883 with those of the corresponding seven months of 1881, as follows:

	1883.	1881.	Inc. or Dec.	P. c.
Gross earnings	\$16,348,171	\$15,112,925	+\$1,235,246	8.1
Expenses	9,122,367	7,165,435	+ 1,956,932	27.3
Net earnings	\$7,225,804	\$7,947,490	- 721,686	9.1

Thus, in spite of an increase of 850 (30 per cent.) in miles worked since 1881, the net earnings have fallen off 9 per cent.

The gross and net earnings and expenses per mile for these seven months, June to December, inclusive, for the three years, have been:

	1881.	1882.	1883.
Gross earnings	\$5,211	\$4,599	\$4,360
Expenses	2,471	2,432	2,433
Net earnings	\$2,740	\$2,167	\$1,929

Thus per mile of road there has been a decrease since 1881 of 16½ per cent. in gross earnings, of only 1½ per cent. in working expenses, and of no less than 30 per cent. (amounting to \$813) in net earnings—not at all a satisfactory result. Of course the additions to the road have involved a comparatively small addition to the capital and fixed charges, but they have caused some increase, and we see that the total net earnings have decreased more than \$700,000. It might therefore be concluded hastily that the great additions to the road have been, so far at least, a burden to it.

Probably enough they have added very little to its profits, for they are mostly in country which, though it has been gaining fast recently, is yet thinly peopled and produces comparatively little to ship; but there have been other circumstances at work to decrease earnings on the old lines, so that we are by no means safe in concluding that the earnings have not been respectable on the new ones. The last large corn crop on the lines of this road was carried in 1881. In that and in the following years the quantity of leading staples brought to Chicago by the Northwestern was:

	Flour, bbls.	Wheat, bu.	Corn, bu.	Cattle, No.	Hogs, No.
1881	1,749,352	5,143,933	15,030,041	238,429	1,051,640
1882	1,365,516	2,960,246	9,026,006	223,678	1,091,616
1883	1,500,189	4,790,592	8,927,479	258,376	1,120,259

Thus we see that this system, though so greatly increased in extent in a very fertile country, brought a seventh less flour and two-fifths less corn to Chicago in 1883 than in 1881, and about 7 per cent. less wheat, which decreases are not nearly balanced by the increase of 8 per cent. in cattle and 6½ per cent. in hogs.

There has been something more than the quality of the crops to cause this and other reductions in traffic and earnings on parts of the system. It has been since 1881 that the Rock Island has established its line to St. Paul and Minneapolis, taking a share of the business which formerly was divided between the Northwestern and the Milwaukee & St. Paul. Just how much it has got we cannot say, but its deliveries of flour and wheat at Chicago have been:

	1881.	1882.	1883.
Flour, bbls.	61,307	443,020	515,847
Wheat, bu.	1,107,334	2,608,042	2,434,457

Most of the flour, but perhaps not a great part of the wheat carried by either road, came from Minnesota, and this is an indication of the important traffic that may have been diverted by one new competing line.

Another, and a more important one, is the Milwaukee & St. Paul's line all the way across Illinois and Iowa from Chicago to Council Bluffs, parallel with and everywhere quite near to the Northwestern's line, and so competing for its local as well as its through traffic. It took from the beginning one-fourth of the through freight, and almost ruined the value of the passenger business last year.

Now with the diversion of traffic that these and less important new competing roads have caused, evidently if the Northwestern's system had not been increased its gross and net earnings would have fallen off largely since 1881.

The contrast which this makes with the course of gross and net earnings of the Milwaukee & St. Paul

and the Chicago, Burlington & Quincy is probably due to the fact that these roads have suffered less diversion of freight from their leading lines. The St. Paul, it is true, must have suffered as much as the Northwestern from the Rock Island's Minnesota line; but it had to set against that the new Council Bluffs line with earnings per mile, doubtless, even in the first year much above the St. Paul's average; and the Burlington, while losing equally with the Northwestern by the St. Paul's diversion of the Council Bluffs traffic, is too far from it to have its local traffic affected by it as the Northwestern's is.

In its last fiscal year (ending with May) 64 per cent. of the Northwestern's gross earnings and 72 per cent. of its net earnings were in the seven months ending with December. In the previous fiscal year likewise 64 per cent. of the gross and 72 per cent. of the net earnings were in these seven months. This, however, may not be the case this year. If it is, the gross earnings this fiscal year will be \$25,544,000 and the net \$9,962,000—an increase in gross of \$1,462,000 over last year and of \$1,860,000 over 1881-82, but a decrease in net of \$47,000 from last year and of \$1,083,000 from 1881-82.

For the five months ending with May much will depend upon the activity of emigration, concerning which we can hardly guess as yet, and much also on the keeping of the peace among the roads between Chicago and Council Bluffs and Chicago and St. Paul. The condition of things at present is precarious, and a great sacrifice of gross and a greater, proportionally, of net earnings is likely to be the result of a contest should one, unfortunately, break out.

The Winter Grain Movement.

The winter grain movement has followed the course of the movement a year ago very closely—that is, there have been very large receipts at the Northwestern markets, and the shipments from those markets have been large also, but the receipts at Atlantic ports have been decidedly small.

For seven successive years the movement has been, in bushels, for the 10 weeks from Dec. 2 to Feb. 9, inclusive (flour not included):

Year.	Northwestern—		Atlantic.
	Receipts.	Shipments.	Receipts.
1877-78.....	25,985,494	15,942,052	36,388,272
1878-79.....	32,405,630	14,118,652	31,285,669
1879-80.....	35,921,188	12,174,455	30,684,608
1880-81.....	33,198,544	16,307,921	29,909,126
1881-82.....	38,928,504	22,852,721	22,662,264
1882-83.....	45,145,361	23,783,870	16,951,397
1883-84.....	48,146,494	23,337,520	19,079,279

Thus the receipts of the Northwestern markets this winter since navigation closed have been larger than in any previous year—nearly 7 per cent. more than last year, 23 per cent. more than in 1882 and 45 per cent. more than in 1881. Certainly no fault can be found with the amount of these receipts. Considering the much smaller wheat crop last year and the much less pressing demand for corn it is astonishing to find that these markets have received more grain this winter than ever before.

And if we turn to the shipments we find that this winter they are very little (2 per cent.) behind those of last year, which were then larger than ever before, and made so large by the exhaustion of stocks of corn in the East and in Europe, which made it necessary to forward it as soon as it was fit to ship. This winter the shipments have been 54 per cent. more than in 1881, when they were larger than ever before. Thus the winter shipments as well as the receipts of the Northwestern markets have been anything but small.

But when we turn to the receipts of the Atlantic ports, we find that while they have been 2,128,000 bushels (12 per cent.) more this winter than last, they were less than in any other winter since 1877, 12 per cent. less than in 1882, 10,830,000 bushels (6 per cent.) less than in 1881, and no less than 17,309,000 (48 per cent.) less than in 1878.

Thus the change to which we have often called attention continues—a growth, apparently, of the Northwestern grain movement, while the movement to the seaboard decreases greatly. So far as these statistics go, it would appear that more and more grain is raised, while less and less is consumed on the seaboard or exported, the natural conclusion from which would be that there has been a very great increase in the consumption of the country between the West and the seaboard—that the Western shipments are more and more absorbed before they reach the Atlantic ports.

Now this doubtless to some extent is true. The great expansion of manufacturing and mining industries in the East—all over the country, in fact—has not been made without considerably increasing domestic consumption of grain. But if this accounted for the whole of it, we should expect to find a movement on the lines which cross Illinois, Indiana and Ohio, if not also Pennsylvania and New York, as heavy this win-

ter as ever before. But this is not the case. Most of these railroads, so far as can be ascertained, have been having an unusually poor business this winter, poorer than they would be likely to have if their grain traffic was as large as in their most prosperous winters. A multiplication of lines partly accounts for this; but not a little, probably, is due to smaller local shipments from interior points not reported at any Northwestern markets, such as shipments from all points east of Chicago, Peoria and St. Louis passing over the Pennsylvania's lines, the Ohio & Mississippi, the Baltimore & Ohio and the Erie—in fact, by far the larger part of the produce of the great and fertile district east of the Mississippi and the Illinois and south of the lakes, for comparatively a small part of the shipments of this territory pass through Detroit, Toledo and Cleveland, which are the only reporting markets east of Chicago and St. Louis.

Now, as we have tried to show heretofore, these three states, which in 1878 and 1879 grew more than 30 per cent. of all the grain produced in the United States, have suffered a great decrease of late years and last year. For six successive years their production of wheat, corn and oats has been:

	Wheat.	Corn.	Oats.	Total.
1878.....	97,876,000	472,828,400	105,630,500	676,334,900
1879.....	147,410,000	553,152,000	107,453,200	808,015,200
1880.....	160,531,000	459,627,000	104,176,700	724,334,700
1881.....	96,695,000	329,111,000	108,814,000	534,620,000
1882.....	141,218,300	383,140,400	136,394,200	660,752,900
1883.....	76,481,800	372,966,500	153,644,000	603,092,300

Thus we see that the production of these three states last year was 121 million bushels less than 1880, and 205 millions less than in 1879. Now comparatively a trifle of the surplus grain of Ohio and Indiana, and probably less than half of that of Illinois is shipped by way of any of the reporting Western markets. An increase or decrease in the production there, resulting perhaps in a great increase or decrease in their surplus marketed, may therefore hardly be felt at all in the receipts and shipments of the Northwestern markets of St. Louis, Peoria, Chicago, Detroit, Toledo and Cleveland, and of course those of Milwaukee and Duluth. In these states the growth of manufacturing industries and of town population, and consequently of grain consumption, has been, perhaps greater than anywhere else in the country, so that with the same production they would have less to spare. Then when we see the enormous decrease in production, it is manifest that there must have been a great decrease in the grain marketed from these states; and as their grain, as we have said, for the most part goes to no reporting Western market, we can understand why the seaboard receipts, which in 1878 were 20 millions, in 1880 18½ millions and in 1881 13½ millions more than the Northwestern shipments, in 1883 were 7½ millions and this year 4½ millions less than those shipments in the ten weeks ending Feb. 9. The grain movement has been heavy from the country west of Mississippi, but light from the country this side of it, which but recently was the chief source of supply.

This fact explains, or helps to explain, why the railroads north of the Ohio River have, many of them, had unsatisfactory earnings for two or three years past. They had for four succeeding years ending in 1880 extraordinary crops, of wheat especially; they have had nothing like them since, though they had a good wheat crop in 1882. Indeed, the decrease in the corn crop since 1879 has been more than our total grain exports in 1883. If it were not that there has been a great reduction in the number of hogs kept there would be hardly grain enough in these states for their own use. Only a very small part of the corn and not a large part of the oats is ever shipped; but if we take into account the wheat production alone we shall find that it was much smaller in these states last year than in any other of the six, was 84 million bushels (55 per cent.) less than in 1880 and 71 million less than in 1879. Much less of the wheat than of the corn goes to a reporting market, for the Illinois production is nearly all south of the latitude of Peoria, and on the numerous railroads which cross the state from east to west. The decrease in this alone is sufficient to account for the great reduction in the seaboard grain receipts.

The Utah Central Railway, whose line extends from Ogden southward through Salt Lake City 280 miles to Frisco, reaching mining districts south of Salt Lake, makes the following return for the last two years:

	1883.	1882.	Decrease.	P. c.
Gross earnings.....	\$1,147,737	\$1,508,663	\$323,926	21.5
Expenses.....	543,286	636,961	92,675	9.1
Net earnings.....	\$604,451	\$871,702	\$267,251	30.7

The gross earnings last year were \$4,097 per mile of road; the net, \$2,080. Interest on bonds requires \$383,000 per year. The old Utah Central, which in-

cluded only the 36½ miles of road between Ogden and Salt Lake City, was an extremely profitable property, earning net more than \$6,000 per mile and paying 12 per cent. dividends. In 1882 the consolidated company (whose stock is controlled by the Union Pacific) paid 6 per cent., and a larger amount of net earnings was expended for improvements than was paid in dividends. In 1883 the net earnings in excess of interest were equal to \$6.73 per share, against \$12.12 in 1882.

The completion of the Denver & Rio Grande to Utah has exposed the Utah Central to competition for the first time in its history, and much of the time the competition has been fierce. A not unimportant traffic to Utah is coke, used there for smelting silver ores. The Union Pacific brought Pittsburgh coke and collected an enormous freight on it; the Denver & Rio Grande has coke ovens on its own road in Colorado, and is interested in developing their production. Just what rates the Utah Central used to get its reports do not show, but in 1882 its average earnings per train mile were no less than \$3.15, and as the loads are not likely to have been large the rates must have been high. But as all lines in the mountain and mining country of the far West showed a decrease in earnings last year, it is probable enough that not all the decrease in Utah Central earnings was due to the new competitors, which cannot reach a large part of the Utah Central's stations.

The *Railroad Gazette* last week contained illustrations and particulars of a compound passenger locomotive for the London & Northwestern Railway. A late number of *Engineering* contains some particulars of a 300-mile trip made by this engine Oct. 26, 1883, from which we take the following:

"The engine ran the Scotch express leaving Euston at 10 a. m. and due at Carlisle at 5:20 p. m., the time allowed for the run of 300 miles being thus 7 hours 20 min., out of which there are stops of 2 min. at Willesden, 5 min. at Rugby, 7 min. at Crewe, and 20 min. at Preston, so that the speed whilst in motion averages over 44 miles per hour, and including stops is 40.9 miles per hour. The train was composed of 13 vehicles, seating in all 305 passengers, the weights being given below:

Engine and tender.....	139,936 lbs.
Cars.....	338,276 "
Passengers and baggage, say.....	20,000 "

498,212 lbs.

"The weather was moist and the rails greasy, but the train was taken up Shap Fell without the assistance of the bank engine, and arrived at Carlisle to time. This incline includes four miles of 1 in 75 (or 70 ft. per mile), near the foot of which (at Tebay) the train was nearly brought to a stand for the assistance of the bank engine, but was again started and taken up without such aid. The quantity of coal used during the trip was 8,848 lbs., or an average of 29.46 lbs. per mile. If from this be deducted 1.2 lbs. per mile as the allowance for lighting up, we get 25.26 lbs. per mile actually used in running the train. The water used was

$$7,546 \text{ gallons, the evaporation thus being } \frac{7,546 \times 10}{8,848} = 8.5$$

lbs. of water per pound of coal."

As English expresses go the train was neither exceptionally fast or heavy. It would be interesting to know the average indicated horse power and resistance of the train, so that some idea might be formed as to the consumption of coal per indicated horse-power. Assuming the average resistance at 14 lbs. per ton of gross weight of train, the average indicated horse-power would be 420, and the consumption of coal per hour being 1,207 lbs., the average consumption per indicated horse power per hour would be 2.87 lbs., which figure does not show any remarkable economy as compared with results obtained from the ordinary form of locomotive when carefully worked. It is, of course, possible that the resistance exceeded 14 lbs. per ton, but this seems an ample allowance for a line which, for the greater part of its length, is nearly straight, and has few gradients exceeding 16 ft. to the mile, except in the last 60 miles, where grades ranging from 40 to 70 ft. to the mile are common.

There seems to be a desire on the part of some of the people of Massachusetts that legislation in that state shall take a backward step in railroad matters. The Governor in his inaugural address called the attention of the legislature to discriminations in rates practiced by the railroads, saying that the law was ineffectual to prevent them for want of a penalty attached to violations of its provisions. Then there was a petition from certain parties in Berkshire County asking relief from the discrimination practiced by the Boston & Albany Railroad in coal rates from Hudson, and in reference to this matter an order was adopted instructing the Committee on Railroads to investigate the charges of discrimination by the Boston & Albany road. From the seaboard came another petition, from certain dealers in fresh fish, praying for a repeal of the law passed last year in relation to discrimination, which is substantially like the English law under which there have been many decisions, which define the rights of shippers and the duties of railroad managers. The effect of such a repeal would be to

revive a law passed at an earlier date last year which was more of the Granger style in its provisions, and which it was found, before the Legislature adjourned, would prove detrimental to commercial interests. Moreover, an order has been adopted with a view to limiting passenger rates to two cents a mile, while season ticket rates are not to be increased above those at present in force. All these proposed measures are now before the Joint Committee on Railroads, and are pressed with some persistency by their advocates. In spirit they are contrary to the policy which has heretofore been followed since the establishment of the Massachusetts Railroad Commission. It is to be hoped that the Legislature will proceed in these matters with the caution necessary in the solution of such complex problems, and which previous legislatures in Massachusetts have shown.

American Master Mechanics in England.

Mr. T. W. Worsdell, who was formerly Master Mechanic in charge of the Altoona shops of the Pennsylvania Railroad, is now Locomotive Superintendent of an English road, the Great Eastern. Strange to say, however, the American features introduced on the engines of this road by his predecessors are discontinued, and Mr. Worsdell has returned to inside cylinders and small cabs, and discontinued the use of four-wheel trucks on express engines, and substituted an arrangement of a single pair of leading wheels with a radial motion, similar to that shown on the compound engine illustrated in last week's *Railroad Gazette*. The great weight, 29,000 lbs., concentrated on the first wheels of a train to strike a curve certainly seems objectionable, though there is some saving in the total weight of the engine. These engines are fitted with Joy's motion, but new freight engines now building have the ordinary link motion. The six coupled wheels, 58 in. diameter on tread, and the roof bars and other parts generally made of wrought iron are of cast-steel. The cylinders are 17½ in. by 24 in., and the main frames solid plates 1½ in. thick.

Mr. I. C. Park, the Locomotive Superintendent of another English line, the North London, was also formerly an American Master Mechanic, having charge of the Buffalo & Lake Huron. The 100 odd engines on this line are practically all of one class, the "American" type with side tanks and slightly inclined cylinders, and haul freight, local and passenger, and do switching indiscriminately. The wheels are 64 in. diameter, the cylinders 17 in. by 24 in., and the boiler pressure 160 pounds. This company, though only owning 12 miles of line, has for many years built all its own engines and cars, and has remarkably neat and well arranged shops. Its fast trains run 16½ miles in 39 minutes, making 7 intermediate stops, passing 17 junctions, and having to obey 65 signals. The line is worked on the block system, and all switches and signals are interlocked. The worst gradient is 88 feet to the mile, and the curves are very numerous. The trains seat 400 passengers, and weigh about 200,000 pounds without the engine. The consumption of coal on these trains is 30 pounds per mile, but is higher on heavier trains making more stops. The trains are lit by ordinary coal gas uncompresssed, carried in rubber sacks in the baggage cars. This arrangement works well, but is expensive, costing 1½ cents per light per hour, and will possibly be superseded by Pintsch's or Pope's gas, costing 1-5 cent and giving a steadier light.

The Chicago & Northwestern and the Milwaukee & St. Paul do not show the enormous increase in earnings over last year in the second week of February that they did in the first week, but instead the Northwestern has an increase of 6½ and the St. Paul a decrease of 6½ per cent., and both show large decrease (the Northwestern 13 and the St. Paul 15 per cent.) from their earnings in the corresponding week of 1882. January and February were bad months for these roads last year, their traffic having been considerably interfered with by snow blockades. From Jan. 1 to Feb. 1 their earnings for three years have been:

	1882.	1883.	1884.
Chicago & Northwestern.....	\$2,396,030	\$1,895,078	\$2,133,297
Chicago, Mich. & St. Paul....	2,148,999	1,902,051	2,079,030

Thus for this period the Northwestern's earnings this year, though 12 per cent. more than last year, are 11½ per cent. less than in 1882; and the St. Paul's, though 9½ per cent. more than last year, are 3½ less than in 1882. Meanwhile the Northwestern's mileage has increased 16 per cent., and the St. Paul's 22 per cent. since 1882. The St. Paul's earnings per mile for this year have been about \$436, against 523 in 1882; the Northwestern's \$560 this year against \$767 in 1882—a very serious decline. It is true, however, that the earnings of these roads were exceptionally large in the winter of 1882. Last year, after unusually light earnings in January and February, there were unusually heavy earnings in March, the traffic held back during the winter by bad weather going forward freely then, but this year it does not clearly appear that traffic has been held back in the Northwest; as we have shown elsewhere the winter receipts of grain at the Northwestern markets so far have been unusually large and not unusually small. And if we take the receipts at the markets to which nearly all the Northwestern grain goes this is even more evident than when we compare the receipts at the eight markets, including Peoria, St. Louis and Lake Erie ports, where the roads in question deliver no grain. The receipts of grain of

all kinds for the ten weeks ending Feb. 9 at Chicago, Milwaukee and Duluth have been:

	1881-82.	1882-83	1883-84
Chicago.....	16,880,386	21,870,033	25,340,009
Milwaukee.....	5,067,719	3,168,801	4,829,209
Duluth.....	125,000	747,575	618,348
The three.....	21,879,107	25,786,409	30,587,566

Chicago receives much more grain from the country south of the Northwestern and St. Paul systems than from that drained by these roads, and fluctuations there might occur in a direction contrary to the course of the receipts by these roads; but as last year it was getting a magnificent crop of wheat, and more corn than this year from the country south of it, which this year has been able to spare very little wheat and not much corn, it is altogether probable that a large part of its gain of 3½ million in grain receipts has been from the Northwestern quadrant, which is further indicated by the increase of nearly 50 per cent. in the receipts at Milwaukee, which receives solely from the territory of these roads. Thus there is reason to believe that an unusual quantity of grain has been already carried by the Northwestern and the St. Paul roads.

There was, however, probably more grain produced on their lines in 1883 than in 1882. The spring wheat crop was not small, but large; the oats crop exceptionally large, and the corn crop, though very poor, probably not very much worse than in 1882. The Department of Agriculture estimates the wheat production of the four states of Wisconsin, Minnesota, Iowa and Dakota as 97 million bushels in 1883, against 75 millions in 1882—a very large increase; the decrease from 233 to 213 millions in corn which it reports does not probably represent the virtual decrease, as the corn last fall was so injured by frost, especially in the territory on these roads, as to be very much less valuable than usual for feeding purposes, and much of it entirely unmarketable. Against this is an increase from 120 to 149 millions in the crop of oats.

Chicago through rail shipments eastward, for the week ending Feb. 9, by the complete report, have been, in tons:

1880.	1881.	1882.	1883.	1884.
38,492	53,200	73,425	43,388	41,834

The shipments of the week this year were 3½ per cent. less than last year, 42 per cent. less than in 1882, and 23 per cent. less than in 1881, but 8 per cent. more than in 1880.

The distribution of the shipments among the several rail roads during this week, for the last two years, has been:

	1884.	1883.		1884.	1883.
Ch. & Gr. Trunk.....	20.4	14.0	Ft. Wayne.....	10.0	21.7
Mich. Cen.....	11.4	24.9	C. St. L. & Pitts.....	3.1	11.0
Lake Shore.....	15.4	20.6	Balt. & Ohio.....	3.5	7.8
Nickel Plate.....	28.5	Chic. & At.....	7.7

Thus the Nickel Plate this year took 3½ times its allotted proportion and much more than any other road, and the Grand Trunk took nearly twice its proportion, and the two together—both new roads—carried 48.9 per cent. of the whole. Both Michigan Central and Lake Shore carried less than their share, but the three Vanderbilt roads together carried a quarter more than their share, while the two Pennsylvania roads together carried but 13.1 per cent. of the whole, which is less than half their share, and the Baltimore & Ohio suffered similarly. Altogether, the figures indicate that the Nickel Plate and the Chicago & Grand Trunk were making or had been making decidedly lower rates than the other roads.

Notwithstanding the very large percentages carried for some weeks by the Nickel Plate, it has not yet carried the proportion to which it is entitled, and the Michigan Central is also short; and the Fort Wayne, which has carried very little for two or three weeks, is not much short, having been much ahead at one time. The Chicago & Grand Trunk is the one road which is far ahead of its proportion, its excess amounting to about one-third of a week's total Chicago shipments.

For seven successive weeks the Chicago shipments have been:

Week ending						
Dec. 31.	Jan. 4.	Jan. 13.	Jan. 19.	Jan. 26.	Feb. 2.	Feb. 9.
37,442	24,795	48,394	65,559	41,095	40,727	41,834

Of late the shipments seem to have settled down to an average of about 41,000 tons, which is in striking contrast to the average weekly shipments in some previous winters. These were 58,568 tons per week in January and 55,256 tons in February last year; 72,515 in January and 56,454 in February in 1882; 59,584 in January and 51,083 in February, 1881. In 1880, at a 40 cent rate well maintained, the average weekly shipments were but 36,892 tons in January, but they rose to 40,234 in February. In 1879, when rates were badly demoralized, the average weekly shipments were 43,470 tons in January and 49,635 in February. Against this we may put the average of 46,482 tons per week from Jan. 1 to Feb. 9 this year, largely carried at cut rates, and regularly for nine days at 20 cents per 100 lbs.

For the week ending Feb. 16, the incomplete report of through and local shipments eastward of flour, grain and provisions, made to the Chicago Board of Trade, gives the total as 40,212 tons, against 57,612 tons in the corresponding weeks of last year, and 45,547 in the previous week of this year. Of the shipments last week 8,354 tons were flour, 25,269 grain and 6,589 provisions. Compared with last year there is a large decrease in each, but largest (40 per cent.) in provisions, and smallest (19 per cent.) in flour. This time it is the Lake Shore that leads in the amount of shipments, carrying 21.2 per cent. of the whole, the Michigan Central following with 17.7 per cent., then the Chicago & Grand Trunk with 16.3, and the Nickel Plate with 16.0 per cent. Thus the three Vanderbilt roads together are credited with 54.8 per cent. of the whole, and the four

northernmost roads with 71.2, leaving but 28.8 per cent. for the four roads further south that have been awarded about 45 per cent. of the whole. The chief sufferers are the two Pennsylvania roads, the Fort Wayne carrying only 7.1 and the Chicago, St. Louis & Pittsburgh 4.8 per cent. of the whole. The Chicago & Atlantic carried 9 per cent., and the Baltimore & Ohio 7.9 per cent.—the latter more than its proportion.

The exports of breadstuffs in January, as reported by the Bureau of Statistics, were to the aggregate value of \$12,284,781 this year, against \$15,835,577 last year, a decrease of 22 per cent. The decrease extends to flour, wheat and corn—the only important exports—as follows:

	1884.	1883.	Decrease.	P. c.
Flour, bbls.....	849,666	935,486	85,820	9.2
Wheat, bu.....	5,040,889	7,005,296	1,964,407	28.0
Corn, bu.....	2,543,562	4,170,706	1,627,144	39.0

For the seven months ending with July the value of the breadstuffs exports has been:

	1884.	1883.	Decrease.	P. c.
Value.....	\$100,256,207	\$133,658,133	\$33,401,926	25.0

In quantity the decrease has been wholly in flour and wheat, and nearly all in wheat, as follows:

	1883-4.	1882-3.	Inc. or Dec.	P. c.
Flour, bbls.....	5,312,263	5,469,470	- 157,207	2.9
Wheat, bu.....	45,175,618	52,684,372	- 37,458,754	45.3
Corn, bu.....	28,229,527	9,380,471	+ 18,849,056	200.9
Rye, bu.....	3,539,367	822,602	+ 2,716,765	330.0
Oats, bu.....	364,910	180,077	+ 184,833	102.7
Barley.....	327,739	266,304	+ 61,435	23.0
Total bu.....	101,542,349	117,896,831	- 16,354,482	13.9

Of flour and wheat together the exports were about 69 million bushels this year against 107 millions last year, and this decrease of 38 millions is nearly equal to half the estimated decrease in production from 1882 to 1883.

The corn exports of 1883-4, with the exception, perhaps, of those made in January, from the crop of 1882; and those of 1882-83 of the crop of 1881. Neither of these crops was very good, but that of 1882 much larger than that of 1881. Last year's crop was not so good as that of 1882, and we may well see a decrease hereafter, as in January, when it amounted to nearly 40 per cent.

In January the exports of wheat from the Pacific coast were not nearly so large as in some previous months, amounting to 1,196,000 bushels, or 32.7 per cent. of the whole wheat exports, while 35 per cent. went from New York and 29 per cent. from Baltimore. Of the flour, less went from the Pacific coast (183,563 barrels, or 21.6 per cent.); 44.6 per cent. went from New York, and 19 per cent. from Boston.

Provision exports in January were of the aggregate value of \$9,094,177 this year, against \$10,978,825 last year, the decrease being 20 per cent. In fresh beef there was a large increase (40 per cent.), but in hog products there was a decrease of \$4,813,481 to \$5,651,524 lbs., or 20 per cent. In dairy products there was the large increase of 32 per cent. in butter and 86 per cent. in cheese, but these are too small to go far in reducing the great decrease in hog products, which were extraordinarily small, as may be seen by the following record of them for January of successive years:

Year.	Pounds.	Year.	Pounds.
1877.....	95,192,474	1881.....	144,527,409
1878.....	125,224,773	1882.....	104,489,707
1879.....	126,136,029	1883.....	84,813,481
1880.....	91,990,466	1884.....	65,651,524

Thus we go back seven years in vain to find a January where these exports were so light as this year. The January exports are usually among the largest of the year. Last year and in 1882, they were 42 million pounds more than in the preceding November, in 1881 32 millions more, but this year the exports were a little less in January than in November.

The Bureau of Statistics gives this year, for the first time, the exports of live cattle. These have not usually been large in winter, but last January 12,844 were exported, against 4,310 last year, and the January exports double the monthly average in 1882, and their value was equal to one seventh of the provision exports, with which it is not included, and it exceeded the value of the fresh beef exports. For the three months ending with January, 35,072 were exported this year, against 12,635 the year before, and the value then also exceeded that of the fresh beef exports.

The value of canned beef is also reported separately for the first time, but not the weight. In January it exceeded a little the value of the salt-beef exports, but for the three months it was nearly a fifth less. It is interesting to note that in this month, when the exports of cattle and cattle products were large and those of hog products unusually small, the value of the latter was \$6,241,175, and that of the cattle \$4,192,071. Thus the value of the two approximate. A few years ago the export of hog products enormously exceeded those of cattle and their products. A further extension of the latter may be of great advantage to the country, and if the price is reduced probably a great extension of their exports is possible. But after increasing rapidly till 1881 they decrease still more rapidly, and in the year ending with June, 1883, 44 per cent. less live cattle and 35 per cent. less cattle product was exported than in 1881.

The trunk line shipments westward were very large from New York in January—larger than in any previous January except 1882, when everything was taken at extremely low rates, and nearly a fifth more than last year, when they were larger than in any other year except 1882. It is quite probable, however, that the shipments were made large by the low rates of the Lackawanna contracts, which had the tendency to attract to it shipments which otherwise would

go by more indirect routes not counted as trunk lines from New York, which always carry at less than the regular rates, and carry a not unimportant amount of traffic when the other roads maintain rates, and do not report it.

In 1883 640 miles of new railroad were opened in Austria-Hungary—more than in any other year since 1873, when 1,058 miles were completed. In the five years from 1874 to 1878, inclusive, only 1,693 miles were opened, and in the next four years only 896 miles, last year's extension having been greater than that of the four years previous. In 1880 only 38½ miles were opened.

The extension of railroads there is not without effect on railroad earnings in this country. We showed recently what an enormous increase of grain production there has been in Hungary within the last ten years, and better transportation will doubtless largely increase the area in that kingdom on which the production of grain for export will become possible. More than three-fifths of the railroad opened in the dual kingdom in the last five years was in Hungary, and two-thirds (445 miles) of that opened last year, yet this amounts to only 94½ miles, and the country is not by any means well provided yet, having but 4,925 miles of railroad on an area of 124,820 square miles—almost exactly equal to that of Iowa and Missouri together (124,210 square miles) which have nearly 12,000 miles of railroad. Moreover, Hungary has 15,725,000 inhabitants; Iowa and Missouri, 3,793,000, or one-fourth as many. In Hungary there is one mile of railroad to 25.3 square miles of territory and 3,193 inhabitants; in Iowa and Missouri one mile to 10.4 square miles and 316 inhabitants. With few exceptions all Europe west and northwest of Hungary consumes more grain than it produces, and Hungary is the nearest country that produces a surplus. The completion of the Arlberg Railroad will give it a better railroad connection than it has had heretofore with Switzerland and France; but it does not by any means depend on a rail connection, for the distance by its own railroads from the heart of the country to the Adriatic is only 250 to 300 miles, and a large part of its exports have always gone by that route, and consuming districts of Germany are almost on its borders. It is near to the consumers of a large part of its surplus production as Western New York is to New land. Probably it will compete hereafter more successfully than heretofore for the supply of Western Europe; it certainly will if transportation by the European railroads to France and the British Channel becomes as cheap as upon our trunk lines. Of course with its large population a much greater part of its production is consumed at home than in any of our Western states; and the area of the country is so limited that the recent rate of increase in the production cannot continue very long, and there are no such possibilities there as in an immense territory like that of Russia. It may, however, increase its grain production by an amount greater than our total exports, and so have a considerable effect on the profitability of wheat-growing here.

The Lehigh Valley Railroad has a smaller proportion of passenger traffic, perhaps, than any other considerable railroad in the country. While it reports for the year ending with November 704 millions of ton-miles of freight, its passenger miles were but 31.8 millions—22 tons of freight to one passenger; the year before the difference was even greater, there being 25½ ton-miles to 1 passenger mile. The passenger earnings were but 8½ per cent. of the total earnings last year, 7.2 in 1882 and 6½ in 1881.

The number of immigrants arriving last January was 12,015, against 12,940 last year and 18,489 in 1882. The arrivals are always smaller in January. The monthly average was 46,683 for the whole of last year, and 59,295 in 1882. It is not possible to judge from the January arrivals what the course of immigration will be next season, which will not fairly begin till March or April.

Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads in 1884 as follows:

Chester & Lenoir.—Extended northwest to Mull Trestle, N. C., 5 miles. Gauge, 3 ft.

Wilmington & Northern.—This company has completed a freight branch in Wilmington, Del., 3 miles long.

Thus is a total of 8 miles of new railroad, making 155 miles reported to date for 1884. The total track reported laid to the corresponding date for 12 years is as follows:

	Miles.	Miles.
1884.....	155	1878..... 170
1883.....	168	1877..... 72
1882.....	419	1876..... 99
1881.....	173	1875..... 80
1880.....	246	1874..... 83
1879.....	70	1873..... 226

The statements include *main track only*, no account being taken of second tracks or other additional tracks or sidings.

TECHNICAL.

Locomotive Building.

The Ohio & Mississippi shops at Vincennes, Ind., have just completed two heavy passenger engines for the road. They are to run on the express trains between Cincinnati and St. Louis, and are expected to make fast time with heavy trains.

The Manchester Locomotive Works in Manchester, N. H., have just completed a locomotive for the Green Mountain Railroad on Mt. Desert, Me. It is of the same pattern as those built for the Mt. Washington road.

The Chicago & Northwestern shops in Chicago are building four new heavy passenger engines for the

road. They have 18 by 24-in. cylinders, and will be the heaviest passenger engines ever used on this road.

The Portland Co. in Portland, Me., is building three locomotives for the Maine Central, three for the Eastern Railroad and one for the Worcester, Nashua & Rochester road. The boiler shops are making a very large boiler for a steamship.

The Illinois Central shops in Chicago are building several double-ender locomotives for use on the suburban passenger trains, and also three mogul freight engines for the road.

Car Notes.

The Barney & Smith Manufacturing Co. in Dayton, O., is finishing a number of very handsome passenger cars for the Chicago, Milwaukee & St. Paul road.

The Beaver Falls Car Works in Beaver Falls, Pa., are building 100 gondola cars for the Pittsburgh & Chartiers Coal & Coke Co. They are to carry 20 tons each.

The Chicago & Northwestern shops in Chicago are building four new dining cars for the road. They are 64 ft. long and are very conveniently arranged.

The Portland Co. in Portland, Me., is building 100 freight cars for the Maine Central road.

Bridge Notes.

Cofrode & Saylor, of the Philadelphia Bridge Works at Pottstown, Pa., have taken the contract for a new bridge over the Ohio River at Beaver, Pa., on the Pittsburgh & Lake Erie road. They built the former bridge at Beaver, which was last week carried away by the great flood in the Ohio.

The contract for a new drawbridge over the Welland Canal on the Canada Southern Division of the Michigan Central has been let to the Detroit Bridge & Iron Works. It will be 147 ft. span and will be built for double track.

Jones & Benner in Philadelphia have taken the contract for the new iron bridge over the Housatonic River in Stratford, Conn., for the New York, New Haven & Hartford road.

A company has been organized with a capital of \$1,000,000 to construct a second railway bridge over the Mississippi from Rock Island to Davenport.

Iron Notes.

Chester Furnace in Chester, N. J., owned by W. J. Taylor & Co., is making from 290 to 300 tons of pig iron per week. The ores used are three-quarters Chester sulphury ores, which, previous to going into the blast furnace, are roasted in the Taylor-Langdon ore-roasting furnace. The iron made from these ores is very strong and tough, and is used almost entirely for special mill purposes.

The Cleveland City Forge and Iron Co. at its annual meeting in Cleveland, O., last week, elected the following officers: President, R. H. Harman; Vice President and General Manager, L. M. Coe; Secretary and Treasurer, G. E. Ely.

Manufacturing Notes.

At the annual meeting of the Allen Paper Car Wheel Co., held Feb. 13, 11,071 shares were represented. The old board of directors and the old officers were unanimously re-elected. The report of the President shows a large increase of business for the year just closed over any previous year.

The Indianapolis Rolling Mill Co. in Indianapolis is building a number of Greenleaf turn-tables for various roads.

The Rail Market.

Steel Rails.—The market is quiet, with only small sales reported, and quotations continue at \$34 to \$35 per ton at mill. There is no pressure to sell, and prices appear to be settled for the present.

Rail Fastenings.—Spikes are steady at \$2.50 per 100 lbs. in Pittsburgh, and track-bolts at \$2.75 to \$3. Splice-bars are quoted at 1.75 to 1.85 cents per pound. There is a fair demand only.

Old Rails.—Old iron rails are in more demand, and quotations are about \$21.50 to \$22.50 per ton for tees at tide-water and \$23 to \$24 for double-heads. Crop-ends (steel) are quoted at \$22, with very little demand.

Keeping Above Water.

The management of the Cincinnati, Hamilton & Dayton road adopted a novel and somewhat risky method to keep its tracks above the water at Cincinnati. It was really a trestle of tracks. A layer of cross-ties was laid upon the original track and rails laid thereon. When the water covered the second track a third was laid in the same manner. The water finally covered the third track, and it was thought imprudent to lay a fourth.

The Trans-Andean Railroad.

A dispatch from Chacabuco, Chili, says that the first train from Buenos Ayres over the Trans-Andean Railroad reached that place Feb. 15. Chacabuco is on the western slope of the Andes, nearly due east from Valparaiso, and about 30 miles north of Santiago.

Trains Upset by the Wind.

Great Britain has lately been visited with unusually violent gales, which have blown one 3 ft. gauge train off the rails in Ireland, and endangered the safety of trains on the standard gauge in Wales. The *Engineer* says eminent authority referring to some of our critical structures, notably Crumlin Viaduct, 212 ft. high, and Severn Bridge, points out that if on crossing a bridge in a gale the passengers open the windows, the wind cannot get such a grip of a train as it would otherwise. There are two cases in illustration. On one of the Welsh railways, during the gale, an empty train was blown off the line. On the Taff Vale, Saturday, in crossing the lofty Quaker's Yard Viaduct, a passenger train was as nearly as possible thrown off the track. The violence of the wind for one moment overcame the impetus of the train, and the train was clearly lifted within a hair's breadth of the top of the rail. A slight increase—and one shudders at the possible calamity that must have ensued.

Work in the Elizabeth Repair Shops.

When engine 169, belonging to the Central Railroad of New Jersey, was taken in for repairs, after running 86,547 miles, the driving-box brasses, which were made of phosphor-bronze, were found in excellent condition, considering the work they had done. A cross section of one of them in this office shows ½ in. of wear. This engine made all the above mileage, most of it on the fastest runs on the Bound Brook route, without having the side-rods down. Another engine of the same class has been running over 100,000 miles since she came out of the shop, and Mr. Woodcock expects that her mileage will reach 150,000 miles before she needs an overhauling. Some of these engines gave a little trouble by breaking the driving-boxes, and Mr. Woodcock found a remedy in planing the flanges slightly beveled. The shops at Elizabethport are very busy with engine and other railroad machine work. There is a full complement of engines in the shop receiving repairs. Every locomotive that comes in gets the extended smoke-box put on, unless it has already been done. The diaphragm used for regulating the draught with the extended smoke-boxes of these engines is different

from that we have seen on any other road. It consists of plates about 8 in. wide, arranged like the slats of a shutter. They are fixed immovably, with a certain opening, but in any case where the draught is not even it can be adjusted by changing the position of the diaphragm plates. Among indications of progress noted in these shops were the making of iron brake beams, and iron running-boards for the locomotives. The brake beams are two iron slabs welded at the ends, and kept apart in the middle by a cast-iron block.—*American Machinist.*

Protecting Frogs.

The Fitchburg Railroad Co. is "blocking" its switch-frogs, in accordance with the recommendation of the Railroad Commissioners recently sent out to all the railroad corporations in Massachusetts.

The New York Commission on the Burning of the "Tolono."

The New York Railroad Commission has filed a report upon the inquiry made by Commissioners O'Donnell and Rogers into the burning of the Wabash sleeping car "Tolono," while running in a train on the New York Central & Hudson River road near Castleton, Dec. 6 last, when three men were badly hurt. The evidence obtained was in substance the same as that brought out by the coroner's investigation. The fact that this car was not supplied with a cord attached to the automatic air brakes is noted as a reprehensible deficiency in equipment. The report says: "It is possible that had the brakes been properly applied a very different result might have happened. This state of facts calls for a severe censure on the sleeping car company and the road. In this case while automatic brakes were provided there was no cord attached to the brakes on this car, there being such cords on every other car. This shows an inexcusable negligence on the part of the road which deserves severe censure. The accident was a most unusual one, and the cause obscure. From the evidence before the Board it is impossible to attach blame to any individual, but the Board recommends that the utmost care be exercised by those in charge of sleeping cars to inspect from time to time through the night so that no fire can get under headway, however originating, and generally that porters be not kept on duty so many continuous hours as to impair their efficiency during the night. There is a device for extinguishing fire on some of the Delaware & Hudson Canal Co.'s engines, which it is claimed works very successfully. The device is inexpensive and would very materially serve a good purpose on many occasions. The attention of railroads is particularly drawn to this matter."

The Wire Age.

Future annalists may well describe this period of American history as the wire age. In no part of the economy of our daily life are we divorced from wire. It is our slave, and yet an ever present master. Sleeping, we repose on wire mattresses. Eating, we see foods which have passed through sieves, and which are sheltered from insect appetite by wire covers. Calling, we pull wires to ring curled wire gongs. Traveling, we are conveyed by cable or electric railways, hoisted by elevators hung on wires, and hurried over wire bridges. We announce our coming by telegraph or telephone wires, and we thread our way by night through streets lighted by means of electric cables. Across our fields are strung many thousands of miles of barbed wire fences against which dumb brutes protest, Texan rangers draw the knife, and lawyers, juries, judges, and reporters whet their intellectual blades. Our clocks are set by wires, our watches run by wires, our books are stitched with wire, our pictures hung by wires, and our politics managed by wires.—*Boston Advertiser.*

Load and Weight of Train on Wide and Narrow Gauges.

The report of the Charlotte, Columbia & Augusta Co. for the year ending with September last, gives statements showing the proportion of load to weight of train, from which the following figures are taken for the main line of 191 miles, which is of 5 ft. gauge, and the leased Chester & Lenoir road of 72 miles, which is of 3 ft. gauge:

	Main line.	Chester & Lenoir.
	Passenger.	Freight.
Mile-tons of engines	8,115,500	10,506,587
" cars	17,197,130	32,456,077
" load	755,849	14,635,451
Total	26,068,539	57,658,115
Percentage of load to total	2.90	25.38
		2.86
		23.00

On the main line the average train load was 29.3 passengers or 65.1 tons of freight; on the Chester & Lenoir 18.3 passengers or 10.3 tons of freight. The traffic on both lines was light. The result shows a greater proportion of dead weight on the narrow-gauge trains.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings will be held as follows:

Camden & Atlantic, annual meeting, at the office in Camden, N. J., Feb. 28.

Chicago, St. Louis & Pittsburgh, annual meeting, at the office in Indianapolis, at 11 a. m. on March 19.

Housatonic, annual meeting, at the office in Bridgeport, Conn., Feb. 29.

Lehigh Coal & Navigation Co., annual meeting, at the Board of Trade rooms, Philadelphia, at 11 a. m. on Feb. 26.

Northern Central, annual meeting, at the company's office in Baltimore, Feb. 28, at noon.

Pennsylvania, annual meeting, in Musical Fund Hall in Philadelphia, at 11 a. m. on March 11.

Dividends.

Dividends have been declared as follows:

Delaware & Bound Brook (leased to Philadelphia & Reading), 2 per cent., quarterly, payable Feb. 19.

Delaware & Hudson Canal Co., 1½ per cent., quarterly, payable March 10. Transfer books close Feb. 23.

Fort Wayne & Jackson (leased to Lake Shore & Michigan Southern), 2½ per cent., semi-annual, payable March 1.

Iowa Falls & Sioux City (leased to Illinois Central), 1½ per cent., quarterly, payable March 1.

North Brookfield, 2½ per cent. from the earnings of the year ending Sept. 30 last.

Railroad and Technical Conventions.

Meetings and conventions of railroad associations and technical societies will be held as follows:

New England Railroad Club, regular monthly meeting, at the club rooms in the Boston & Albany passenger station in Boston, Wednesday, Feb. 27, at 7:30 p. m. Subject for discussion: "Which is the Safest Way of Turning a Wheel-tilt, Straight or Tapering?"

National Association of General Passenger & Ticket

Agents, regular semi-annual meeting, in Cincinnati, O., Tuesday, March 18.

General Time Convention, Spring meeting, at the Grand Hotel in Cincinnati, O., at 11 a. m., on Wednesday, April 9.

Southern Time Convention, Spring meeting, at No. 46 Bond street, New York, at 11 a. m., on Wednesday, April 16.

Railway Car Accountants' Association, annual convention, in Richmond, Va., on Tuesday, May 20.

Foreclosure Sales.

The Austin & Northwestern road will be sold in Austin, Tex., May 23 next, under a decree of foreclosure and sale granted by the United States Circuit Court. The road as projected was to run from Austin, Tex., to Abilene, about 500 miles; it is completed from Austin to Burnet, 60 miles. By the latest report there were \$420,000 first-mortgage bonds outstanding.

Southern Railway & Steamship Association.

A called meeting of the Southern Railway & Steamship Association began in Washington Feb. 19. The object of the meeting is to adjust matters of disagreement between the East Tennessee, Virginia & Georgia and the Central of Georgia, and to decide whether the Association is to continue under the present agreement. The convention was called to order by the President, Hon. Joseph E. Brown, the Secretary and General Commissioner Powers also being present. At the afternoon meeting only routine business was transacted.

In the evening the Association met with closed doors. It is understood that the committee to which was referred the points of difference between the Central and the East Tennessee companies made its report in the shape of a set of resolutions, the purport of which was that the companies belonging to the Association were entitled to the exclusive control of all traffic brought to competitive points. The resolutions were adopted, whereupon Mr. Fink, representing the East Tennessee Co., gave notice that that company would retire from the Association. A discussion followed, several members remarking that the resolutions would be equivalent to a dissolution of the Association. It was moved that the existing agreement be extended until July, and that the Executive Committee meet June 1 and endeavor to arrange the difficulties, and, in the event of their failure to agree, a general meeting of the Association to be called, to provide, if possible, for a further continuance of the agreement until January next. Mr. Fink said he would reconsider his action if this motion was adopted. The motion was carried and Mr. Raoul then gave notice that the Central of Georgia would refuse to be bound by the agreement after March 1. After further debate the meeting adjourned until next day in order to give time for further consideration.

A dispatch from Washington, Feb. 20, says: "The Southern Railroad Association this morning agreed to maintain the existing pooling arrangements south of the Ohio and east of the Mississippi until July 1, and that if the Executive Committee shall approve by June 1, the pool shall be maintained until Jan. 1, next."

Baltimore & Ohio Employees Relief Association. The December sheet of this Association shows 728 benefits paid during the month to employees, as follows: Main Stem, Transportation Department, 90; Machinery Department, 201; Road Department, 75; Trans-Ohio divisions, 156; Pittsburgh Division, 75; physicians' bills, 131. The largest single payment was \$1,500, and two of this amount were made, to the mother of G. W. Reynolds, engineer on the Pittsburgh Division, and to the widow of James A. Dunn, switchman on Chicago Division. Both men were accidentally killed.

Messrs. Sylvester Osborn and S. H. Trigg have been chosen members of the board of trustees to represent the depositors in the savings fund.

The sheet gives a list of the agents at various points on the company's lines who are authorized to receive deposits for the savings fund. Employees or their wives may make deposits with any of these agents, but not less than \$1 nor more than \$100 can be deposited by one person in one day.

An important change in the regulations relating to the savings fund is announced in the following circular: "Notice is hereby given all employees of the Baltimore & Ohio Railroad Co. of an amendment to the rules of the savings fund feature of the Relief Association, whereby the privilege of making deposits in the savings fund is extended to all employees of the Baltimore & Ohio Railroad Co., or of other companies operating its branches and divisions, whether they are members of the Relief Association or not."

ELECTIONS AND APPOINTMENTS.

Atlantic & Pacific.—General Superintendent F. W. Smith has issued the following circular: "Mr. W. C. Dennison is hereby appointed General Freight and Passenger Agent of this company—headquarters at Albuquerque—vice Mr. C. R. Williams, resigned. All of general order No. 42 that conflicts with the above is recalled."

Avon, Genesee & Mt. Morris.—This company has elected officers as follows: President, M. F. Reynolds, Rochester, N. Y.; Vice-President, Hiram P. Mills, Mt. Morris, N. Y.; Secretary and Treasurer, George W. Phelps, Mt. Morris, N. Y. The road is leased to the New York, Lake Erie & Western.

Baltimore & Ohio.—Mr. J. H. B. Whitridge has been appointed Supervisor of Trains of the Trans-Ohio Divisions. The appointment took effect Feb. 5.

Baltimore & Ohio Telegraph.—Mr. Charles Selden has been appointed General Manager in place of Robert Stewart, resigned. Mr. Selden was recently Superintendent of the Wabash, St. Louis & Pacific telegraph lines.

Central Pacific.—General Superintendent J. A. Fillmore announces the following appointments: "Mr. J. A. Muir has been temporarily appointed Assistant Superintendent at Tucson, to relieve Col. A. A. Bean, who has applied for an extended leave of absence. Mr. F. G. Rice has been appointed Assistant Division Superintendent of the Sacramento and Oregon divisions and the California Pacific Railroad, vice Mr. J. A. Muir, transferred."

Chicago & Alton.—The following circulars are dated respectively Jan. 31 and Feb. 1:

"Mr. H. H. Lyon is appointed Storekeeper at Bloomington, vice H. L. Dunham. Appointment takes effect Feb. 1, 1884."

"Mr. Lyon is hereby appointed Chief Clerk of the Machinery Department, to take effect same date." These appointments are in addition to Mr. Lyon's duties as Car Accountant, which position he still retains.

Chicago & Northwestern.—Mr. W. S. Mellen, General Freight Agent, has issued the following notice: "On and after March 1, 1884, the jurisdiction of Mr. Emmons Blaine, Division Freight Agent of the Northern Iowa Division, will be extended over all this company's local freight business in

Iowa and the Iroquois Branch in Dakota, south of Iroquois, with headquarters at Cedar Rapids. All communications respecting the local freight business in territory described will be addressed to Mr. Blaine, at Cedar Rapids, Ia. Mr. H. R. McCullough, Assistant General Freight Agent, will have charge as heretofore."

Chicago, Rock Island & Pacific.—Mr. J. M. Johnson has been appointed Assistant General Freight Agent in place of T. P. Wolfe, deceased. Mr. Johnson has been for two years past Assistant General Freight Agent of the Cincinnati, Indianapolis, St. Louis & Chicago road.

Chicago & Western Indiana.—Mr. James Roosevelt has been chosen a director in place of E. B. Stahlman resigned.

Cincinnati, Columbus & Hocking Valley.—Mr. Thomas W. Hanna has been appointed Receiver of this road by the United States Circuit Court in Cincinnati.

Cincinnati, New Orleans & Texas Pacific.—At the annual meeting in Cincinnati, Feb. 18, the following directors were elected: W. A. Goodman, T. G. Graff, Alexander McDonald, John Scott, Baigis Swift, Augustus Wessel, Cincinnati; Otto Plock, New York.

Mr. W. H. Tomlinson has been appointed Assistant Superintendent of Motive Power, with office at Ludlow, Ky. He has been connected with the road for some time.

Mr. J. W. Fowler has been appointed Master Mechanic of the New Orleans & Northeastern Division, with office at Meridian, Miss., where the shops of the division are.

Colorado, San Angelo & Southern.—The officers of this new company are: President, A. W. Dunn; Vice-President, J. T. Davis; General Superintendent, E. H. Sabin; Secretary, H. R. Solomon; Treasurer, S. N. Sherwin. Office at Colorado, Mitchell County, Texas.

Connotton Valley.—Mr. George H. Liggett has been appointed General Freight and Passenger Agent in place of Theodore Vogdes, resigned.

Deer Park & Utica.—The directors of this new company are: George C. Cadwell, John S. Cluxton, Wm. Cluxton, James C. Reynolds, Deer Park, Ill.; Herbert L. Gilbert, Amos T. Griffin, Utica, Ill.; Enoch Y. Manchester, Ottawa, Ill.; John Francy, Toronto, Ont.; Thomas Connelly, Chicago.

Denver & Rio Grande.—The following circular from General Passenger Agent F. C. Nims is dated Denver, Col., Feb. 1:

"Mr. W. B. Cobb, heretofore in the service of this department at Chicago, is appointed General Eastern Passenger Agent, with office at No. 319 Broadway, New York. Mr. S. G. Wickery is appointed Acting Western Passenger Agent, with office at No. 46 Clark street, Chicago. Both appointments are in effect this date."

Great Eastern, of Canada.—At a recent meeting the following directors were chosen: James Armstrong, A. B. Chaffee, C. N. Armstrong, John Rankin, L. H. Massue, B. B. Smalley, C. B. Carter. The directors then chose James Armstrong President and John Rankin Vice-President.

Kansas Railroad Commission.—The Governor of Kansas has appointed Mr. A. Gillette, of Emporia, a Railroad Commissioner in place of Henry Hopkins, deceased. Mr. Gillette is a lawyer, and also owns a large farm.

LaCrosse, Iowa & Southwestern.—Mr. M. J. McCabe has been appointed Chief Engineer of this new road.

Lake Shore & Michigan Southern.—Mr. John Robinson has been appointed Foreman of Engine-houses and Engine Dispatcher, at Elkhart, Ind., vice C. L. Aiken, resigned. Orders in relation to the movement of engines on the Michigan Southern Division, may be addressed to John Robinson, Elkhart.

Louisville, Evansville & St. Louis.—Mr. George T. Evans has been appointed General Manager in place of Mr. Webster Snyder, who goes to the Gulf, Colorado & Santa Fe. Mr. Evans has been Secretary and Treasurer of the company for some time.

Louisville, New Albany & Chicago.—At the annual meeting last week the following directors were chosen: John J. Astor, Robert Lenox Kennedy, Samuel Sloan, R. G. Rolston, E. H. Green, Wm. Whitwright, J. A. Garguilo, Sebastian S. Schleinger, James Roosevelt, New York; B. H. Young, R. S. Veech, E. D. Standiford, Louisville; Robert R. Hitt, Mount Morris, Ill. The board re-elected James Roosevelt, President; R. G. Rolston, Vice-President.

Lowell & Andover.—At the annual meeting in Lowell, Mass., Feb. 20, the following were elected: President, Frederick Ayer; directors, Horace J. Adams, George Ripley, Frederick F. Ayer, E. M. Sargent, Jacob Nichols, Arthur P. Bonney, Benjamin Walker, O. H. Moulton, Prescott C. Gates. The road is leased to the Boston & Maine.

Marquette, Houghton & Ontonagon.—Mr. Joseph Guy has been appointed Road-Master. He had charge of construction on the Houghton Extension of the road.

Meadville & Linesville.—The officers of this new company, successor to the Meadville Railroad Co., are: President, W. Wallace Delamater; Directors, T. A. Delamater, A. C. Huidekoper, W. S. Magungle, D. S. Richmond, H. L. Richmond, Jr., Lewis Walker. Office in Meadville, Crawford County, Pennsylvania.

Mexican National.—The following appointments on the Northern General Division are announced in a circular from President W. J. Palmer:

"Mr. F. A. Lister, having tendered his resignation as Superintendent, to take effect Feb. 10, 1884, Mr. C. A. Merriam is hereby appointed Superintendent of the line from Corpus Christi to Saltillo, and of the Matamoros Division, to take effect from this date."

"Mr. E. A. Handy, Engineer in Charge, will take charge of the engineering and maintenance of way of all operated lines from Corpus Christi to Saltillo, and of the Matamoros Division, reporting to Superintendent Merriam."

"Mr. F. E. Butterfield, Assistant Engineer and Superintendent Matamoros Division, will report to Superintendent Merriam."

"Mr. F. W. Baldwin is hereby appointed Assistant Superintendent of the line from Corpus Christi to Saltillo."

Missouri Pacific.—A dispatch from St. Louis, Feb. 19, says: "It will be officially announced to-morrow that Col. A. A. Talmage, General Transportation Manager of the Missouri Pacific Railway system, has been appointed Fourth Vice-President of that system, with jurisdiction extending over the entire Wabash line. This appointment retires Col. Andrews from the General Superintendency of the Wabash, but he has been appointed Consulting Engineer of that road."

Mr. F. A. Palmer has been appointed General Agent of the Passenger Department in Chicago in place of Howard E. Laing, resigned.

Moline-Rock Island Southern.—The directors of this new company are: H. A. Ainsworth, Charles H. Deere, John M. Gould, L. W. Wheelock, Moline, Ill.; N. M. Blanding,

A. C. Hart, P. L. Mitchell, Morris Rosefeld, Rock Island, Ill.; L. A. Ellis, G. H. French, J. W. Green, James T. Lane, W. C. Wadsworth, Davenport, Iowa.

New Orleans, Mobile & Texas.—At the annual meeting, Feb. 18, the following directors were elected: E. H. Green, C. C. Baldwin, W. S. Williams, J. T. Woodward, F. W. Foote, H. Anthon, David Thomson. Mr. E. H. Green was elected President and D. Thomson Secretary. The road is owned by the Louisville & Nashville.

Philadelphia & Erie.—At the annual meeting in Philadelphia last week the following directors were chosen: J. N. DuBarry, Wm. L. Elkins, Wm. J. Howard, Wistar Morris, Henry M. Phillips, N. Parker Shortridge, Samuel Gustine Thompson, Henry D. Welsh, John P. Wetherill, Wm. Hasell Wilson. The board elected Wm. Hasell Wilson President; Joseph S. Vanzant, Secretary.

St. Louis & Chester.—This company has elected directors as follows: Peter W. Baker, Sparta, Ill.; John P. Deming, Francis F. Gannon, Spencer Tompkins, David T. Tripp, Waterloo, Ill.; Wm. A. Buckmaster, St. Louis. The board elected David T. Tripp President; Wm. P. Buckmaster, Vice-President; Spencer Tompkins, Secretary and Attorney; Charles C. Chase Treasurer.

Scioto Valley.—At the annual meeting in Columbus, O., Feb. 14, the following directors were elected, there being no change in the board: Horace Porter, E. T. Winslow, J. B. Hawes, F. H. Davis, W. W. Franklin, Geo. Skinner, J. Robinson, Marcus Boggs, George Davis.

Souris & Rocky Mountain.—The officers of this company are: President, James Beatty; Vice-President, J. Riopelle; directors, L. Billy, C. W. Bunting, James Hay, Warren Kennedy, John Norquay, D. B. Woodworth.

Texas & St. Louis.—Mr. Harry Flanders has been appointed Master of Transportation of the Texas Division.

Toledo, Cincinnati & St. Louis.—Mr. P. B. Dudley, General Agent at Cincinnati, having resigned, the office has been abolished, and his duties will hereafter be performed by C. E. Glass, the Freight and Ticket Agent. The office of Train Master of the St. Louis Division having been abolished, the duties of the office will be performed by C. W. Thompson.

Vermont & Canada.—At the adjourned annual meeting in Bellows Falls, Vt., Feb. 19, the following directors were chosen: Charles E. Billings, Jed. P. Clark, A. S. Hall, Henry D. Hyde, John L. Mason, Thomas H. Perkins, Augustus Russ. The company is now controlled by and practically merged with the Consolidated Railroad Co. of Vermont.

Wabash, St. Louis & Pacific.—Mr. F. A. Palmer has been appointed General Agent of the Passenger Department in Chicago in place of Howard E. Laing, resigned.

Washington, Ohio & Western.—Mr. C. C. Coe has been appointed Auditor of this company, to date from Feb. 15, 1884. His address will be Alexandria, Virginia.

PERSONAL.

—Mr. P. B. Dudley has resigned his position as General Agent in Cincinnati of the Toledo, Cincinnati & St. Louis road.

—Mr. Ross Kells, late Superintendent of Motive Power of the New York & New England road, has accepted an engagement with the French Smoke Consumer Co., of Boston.

—Mr. G. K. Barnes, late General Ticket Agent of the Northern Pacific, has purchased an interest in the Cottage Organ Co., of Chicago, and will hereafter reside in that city.

—Capt. John Postell, General Manager of the East & West Railroad, of Alabama, was met at Cadartown, Ga., Feb. 9, by a committee representing the employees of the road, and presented with a handsome gold-headed cane. Conductor J. E. Good made the presentation speech.

—Mr. Charles A. Savage, who died in Quincy, Ill., Feb. 2, was born in Bangor, Me., in 1814, and settled in Quincy in 1839, becoming a prominent lawyer in that city. He was President of the old Quincy & Toledo, Treasurer of the Quincy & Chicago and a director of the Quincy & Palmyra Co. Later he served as a director and secretary of the Quincy & Warsaw, a director of the Toledo, Wabash & Western, and as President of the Quincy, Alton & St. Louis and the Quincy, Missouri & Pacific companies.

—Concerning Mr. Henry Villard Mr. James Bryce made some remarks recently, which are reported as follows in the *Pall Mall Gazette*: "Mr. Bryce spoke feelingly of the misfortune which has overtaken Mr. Villard, whose health has broken down, and whose wealth has disappeared in the depression of the stocks of the great railroad schemes with which his name is identified. 'Mr. Villard,' said Mr. Bryce, 'is a man not only of great abilities, but of a very high type of character, a man who has thought and cared much more about the development of the country than about his own personal interests. He has done vast things for the North-west and for Oregon, and now that it is known that he has lost his own property in endeavoring to save that of others who had invested by reason of their faith in him, there has been a general expression in America of respect and sympathy for him.' Mr. Villard, we are glad to hear, intends to visit this country in the spring, if his health permits."

—Gen. Hugh Henry Baxter, once a well-known railroad magnate and a successful operator in Wall street, died Feb. 17, at his residence in New York, at the age of 66 years. General Baxter was born in Bellows Falls, Vt., in the year 1818. He was the son of Judge H. H. Baxter, of the Superior Court of the State. He attained only a common school education in Bellows Falls, and at the age of 16 years he went to Boston, where he became a clerk with a large mercantile firm. He remained in that position until he was 21 years old. Soon afterward he began business in his own name and became a railroad contractor. His first contract was the construction of the Rutland & Burlington Railroad, and he next went to Ohio and built part of the Toledo & Wabash. He came to New York, and became a large speculator in Wall street. He was a director of the New York Central when Commodore Vanderbilt acquired control of the road, and was the only one of the directors who was retained under the new management. He succeeded Mr. Keop as President of the New York Central Railroad for a short time, and was an intimate friend and confidential adviser of Commodore Vanderbilt until the latter's death. At the beginning of the war Mr. Baxter was living in Rutland, Vt. He was appointed Adjutant-General of the state by Gov. Fairbanks. Gen. Baxter personally superintended the fitting out of the several Vermont regiments, and personally assumed a large share of the expense. At the close of the war he established the Baxter National Bank in Rutland, where he was the sole proprietor of the celebrated Rutland marble quarries. Mr. Baxter built an elegant residence in Rutland, and established the most valuable

and complete stock-farm in Vermont. He was an ardent Republican, and evinced a deep interest in politics, but he was never a candidate for any public office. He was eminently charitable, and subscribed largely for all benevolent objects in Rutland and New York. During the last seven years Mr. Baxter has been an invalid, and for the last five or six months he has been confined to his house from disease of the heart and kidneys, which ultimately caused his death. He leaves a widow and one son, who has just attained his majority.

TRAFFIC AND EARNINGS.

Railroad Earnings.

Earnings for various periods are reported as follows:

Month of January:	1884.	1883.	Inc. or Dec.	P. c.
Ala. Gt. Southern.	\$84,124	\$84,495	D.	371 0.4
Char. C. & Aug.	65,375	70,617	D.	5,242 7.4
Net earnings.	23,176	34,720		
Cin. Ind. St. L.				
& Chi.	191,782	175,082	I.	16,700 9.5
Col. & Greenv.	56,045	71,077	D.	14,432 20.3
Net earnings.	24,069	9,353	I.	14,716 156.6
Fla. Cent. & W.	40,379	41,594	I.	1,215 2.9
Fla. Transit & P.	51,795	42,319	I.	9,476 22.5
Gulf. Col. & S. F.	145,307	102,015	D.	16,708 10.3
Kentucky Can.	49,648	40,185	D.	537 1.1
Little Rock, M. R.				
& Texas.	32,000	38,000	D.	6,000 15.8
Marquette, H. & Ont.	19,638	19,203	I.	435 2.3
New Or. & N. E.	35,900	3,684	I.	32,116
Rich. & Danv.	296,889	259,757	I.	7,132 2.7
Net earnings.	111,612	117,034	D.	5,412 4.6
St. L. Alton & T. H.				
Belleville Line.	72,195	75,355	D.	3,160 4.2
St. L. & Cairo.	19,766	30,375	D.	10,609 53.0
St. L., Ft. Scott & Wichita.	34,965			
Texas & St. L.	70,383			
Tel. Cin. & St. L.	93,000			
Vicks. & Mer.	43,435	51,385	D.	7,950 15.5
Vicks. Shreve. & Pacific.	12,755	11,984	I.	771 6.4
Va. Midland.	107,115	104,387	I.	2,728 2.6
Net earnings.	37,136	34,227	I.	2,909 8.6
Western N. C.	29,212	20,690	I.	8,522 45.5
Net earnings.	2,074	5,021	D.	2,947 40.8
First week in February:				
Bur. C. R. & No.	\$48,784	\$34,961	I.	\$13,823 39.2
Chi. & W. Mich.	26,146	17,992	I.	9,054 53.2
Ches. & Ohio.	77,880	60,586	I.	17,294 28.4
Eliz. Lex. & Big Sandy.	13,618	14,194	D.	576 4.1
Flint & Pere Marquette.	45,895	38,548	I.	7,347 16.2
Mem. & Charles.	32,303	28,282	I.	4,021 14.3
Peoria, Dec. & E.	11,734	9,590	I.	2,144 22.3
Second week in February:				
Chi. & Gt. Trunk.	\$59,546	\$38,843	I.	\$20,703 53.1
Chi. & East. Ill.	23,315	28,988	D.	5,673 19.6
Chi. Mil. & St. Paul.	307,000	328,727	D.	21,727 6.9
Chi. & Northwest.	325,260	304,800	I.	20,500 6.7
Canadian Pacific.	50,000	47,000	I.	3,000 6.4
Long Island.	35,533	35,518	I.	15 0.0
Louis. & Nashv.	217,845	243,325	D.	25,480 10.5
Mil. L. S. & W.	18,560	15,318	I.	3,242 21.4
Northern Pacific.	125,800	101,600	I.	24,200 23.7
Roch. & Pitts.	22,767	5,369	I.	16,998 316.6
St. L. & San F.	66,100	50,300	I.	15,800 23.5
St. P., M. & M.	95,000	91,500	I.	3,500 3.8

Year ending Dec. 31:

	1883.	1882.	Inc. or Dec.	P. c.
Cleve. Col. Cin. & Ind.	\$4,259,733	\$4,400,040	D.	\$140,307 3.7
Danb. & Norwalk.	216,291	208,011	I.	8,280 4.0
Union Pacific.	29,780,964	30,363,927	D.	582,963 2.0
Net earnings.	13,090,823	14,301,977	D.	1,211,154 8.5
Month of December:				
Cleve. Col. Cin. & Ind.	\$314,785	\$355,129	D.	40,344 11.3
Danb. & Norwalk.	14,336	15,332	D.	996 6.6
Georgia Pacific.	58,883			
Net earnings.	29,120			
Union Pacific.	2,407,215	2,559,005	D.	151,790 5.9
Net earnings.	676,326	1,193,784	D.	517,458 43.4

* Deficit.

Weekly reports of earnings are generally estimated in part, and are subject to correction by later statements.

Cotton.

Cotton movement for the week ending Feb. 15 is reported as follows, in bales:

	1884.	1883.	Inc. or Dec.	P. c.
Interior markets:				
Receipts.	32,451	58,964	D.	26,513 45.2
Shipments.	46,757	75,782	I.	29,025 38.3
Stock, Feb. 15.	268,069	326,796	D.	58,727 18.0
Seaports:				
Receipts.	105,921	146,130	D.	40,209 27.5
Exports.	112,267	100,549	I.	11,718 11.6
Stock, Feb. 15.	1,013,548	925,343	I.	88,205 9.5

The Commercial and Financial Chronicle gives the total receipts from plantations for the cotton year, from Sept. 1 to Feb. 15, at 5,012,302 bales, against 5,574,576 bales for the corresponding period last year, a decrease of 562,274 bales, or 10.1 per cent.

Grain Movement.

For the week ending Feb. 9 receipts and shipments of grain of all kinds at the eight reporting Northwestern markets and receipts at the seven Atlantic ports have been, in bushels, for the past eight years:

Year.	Northwestern receipts.	Northwestern shipments.	Atlantic receipts.
1877.	1,419,072	1,111,317	1,906,159
1878.	2,676,554	2,004,448	4,151,378
1879.	3,850,118	1,639,842	4,713,985
1880.	4,279,151	1,997,067	3,777,028
1881.	2,460,285	1,639,703	2,001,199
1882.	4,327,788	2,801,406	2,394,381
1883.	3,503,907	2,471,478	2,656,554
1884.	4,417,802	2,804,567	1,692,139

Thus the receipts of the Northwestern markets for the week were larger than in the corresponding week of any previous year, and 914,000 bushels more than last year. They were, however, 306,000 less than in the previous week of this year. The shipments of these markets were larger than in the corresponding week of any previous year except 1882, and 500,000 bushels (17.8 per cent.) went down the Mississippi. They are the first river shipments that have been reported this year. The Atlantic receipts for the week were smaller than in the corresponding week of any of the seven years previous, and 984,000 bushels (40 per cent.) less than last year. They were also 618,000 bushels less than the week before, and 436,000 less than in the week ending Jan. 26, but with these exceptions were the largest for seven weeks.

There is nothing particularly noticeable in the distribution of the Northwestern receipts. Chicago and Milwaukee received 59 per cent. of the whole; St. Louis and Peoria 26 1/2 per cent.; Detroit, Toledo and Cleveland 14 per cent. While the total decrease from the previous week in Atlantic receipts was 618,000 bushels, at New York there was a decrease of 550,000. Its proportion of the whole was 35 per cent., while Boston had 18.3 per cent. and a larger amount than before for six weeks.

The exports of Atlantic ports for the week ending Feb. 9 have been:

	1880.	1881.	1882.	1883.	1884.
Flour, bbls.	83,161	149,103	115,877	231,157	143,687
Grain, bu.	1,028,241	2,283,870	1,006,371	2,201,291	1,773,477

Including flour the exports this year were a little more than those of 1880 and one-half more than in 1882, but less than in 1881 and 1883.

San Francisco wheat exports for the seven months of the California crop year from July 1 to Jan. 31 were as follows, flour in barrels and wheat in bushels, flour being reduced to wheat in the totals:

	1883-4.	1882-3.	Inc. or Dec.	P. c.
Flour.	778,373	640,762	I.	137,611 21.5
Wheat.	13,241,242	17,814,485	D.	4,573,243 25.7

Total, bushels. 17,139,107 21,018,295 D. 3,885,188 18.5
The January shipments of flour were large, but those of wheat were very light.

Coal.

Coal tonnages for the week ending Feb. 9 are reported as follows:

	1884.	1883.	Inc. or Dec.	P. c.
Anthracite.	441,037	658,050	D.	217,013 32.9
Eastern bituminous.	125,597	103,486	D.	37,889 23.2
Coke.	55,009	46,433	I.	8,576 18.5

The anthracite coal trade is dull and there has been little or no increase in the demand.

A conference was held in Baltimore last week between representatives of the Pennsylvania and the Baltimore and Ohio companies for the purpose of fixing rates on bituminous coal to tidewater. The result has not yet been made public.

The coal tonnage of the Pennsylvania Railroad for the week ending Feb. 9 was:

	Coal.	Coke.	Total.
Line of road.	108,740	52,265	161,105
From other lines.	52,010	2,644	54,654

Total. 160,750 55,009 215,759

The total tonnage this year to Feb. 9 was 1,347,127 tons, against 1,374,531 tons to the corresponding date last year, a decrease of 27,404 tons, or 2 per cent.

Anthracite coal tonnage for January is reported as follows in the statement of Mr. John H. Jones, the Official Accountant, which includes the entire production of anthracite coal, excepting that consumed by employees, and for steam and heating purposes about the mines:

	1884.	1883.	Inc. or Dec.	P. c.
Phil. & Reading.	981,783	35.9		
Central of N. J.				
Lehigh Valley.	392,832	20.7		
Del. Lac. & Wes.	307,256	16.1		
Del. & Hud. Can.	199,712	10.5		
Penn. R. R.	212,324	11.2		
Penn. Coal Co.	88,012	4.7		
N. Y., Lake Erie & Western.	17,054	0.9		
Total.	1,899,572	100.0	2,075,742	100.0

New Jersey Central tonnage is now included in Philadelphia & Reading. The Lehigh Valley tonnage includes that of the State Line & Sullivan road, which was 8,287 tons in January of this year. In addition to the tonnage above there were 26,237 tons transported from mines this year by the Delaware & Hudson Canal Co., which is included in tonnage of other interests.

The total decrease in shipments for the month was 176,170 tons, or 8.5 per cent. All the companies showed decreases except the Pennsylvania Railroad.

The stock of coal on hand at tidewater shipping points, Jan. 31, 1884, was 637,987 tons; on Dec. 31, 1883, 748,330 tons; decrease, 110,343 tons, or 14.8 per cent.

Cumberland coal shipments for the week ending Feb. 16 were 26,554 tons. The total shipments this year to Feb. 16 were 201,339 tons, against 222,051 tons to the corresponding date last year; a decrease of 20,712 tons, or 9.3 per cent.

Boston Traffic Notes.

During the month of January the Boston & Albany delivered to the New York Central 9,089 freight cars, and received from the same road 9,487 cars. The number of freight cars sent out of Boston the same month was 7,533.

The Lackawanna and the Trunk Lines.

It is said that the arbitrators have awarded the Delaware, Lackawanna & Western road 14 per cent. in the west-bound trunk line freight pool. Arguments were made last week by Commissioner Fink for the Trunk Lines and President Sloan for the Lackawanna, before the arbitrators, Mr. Charles Francis Adams, Jr., and Mr. James F. Joy. They could not agree and fixed upon Mr. Robert Harris, President of the Northern Pacific, as the third arbitrator, whose decision should be final. Upon the presentation of the arguments to him he agreed with Mr. Joy in fixing 14 per cent. as the percentage to be awarded to the Lackawanna.

Transcontinental Traffic Association.

Mr. J. W. Morse, General Passenger Agent of the Union Pacific, announces that, by order of the Commissioner of the Transcontinental Association, the circular issued Aug. 3, concerning free transportation between Denver and Leadville, ceased to be in effect Feb. 10. The same authority orders discontinuance on same date of free tickets from Ogden to Salt Lake City and return to holders of overland tickets. Through tickets to Ogden and west thereof, reading via Omaha, will continue to be good via Denver Junction and Denver, as heretofore, going west via Cheyenne, but not via Cheyenne to Denver and back to Cheyenne.

Overloading Cars.

Mr. R. B. Mitchell, General Manager of the Blue Line, has issued the following notice to agents and connections: "I am in receipt of the following from the New York Central & Hudson River Railroad Co.: 'We are subjected to much trouble by breaking of trucks from the effects of persistent overloading of cars. A general impression seems to prevail that the capacity of all cars is 20 tons, and this quantity is frequently loaded without regard to actual capacity of the car. It has become absolutely necessary that this difficulty be remedied, and I therefore desire to give notice on behalf of this company that we are forced to and shall refuse to receive any car loaded beyond its capacity.' Please note and be governed accordingly."

Chicago Passenger Matters.

In Chicago Feb. 14 the local passenger agents of the roads on the east-bound pool decided to maintain the present rates to Buffalo until March 1. Meantime an agreement in relation to the differential rates recently allowed will be submitted to Commissioner Fink, and it is expected that he will render a final decision in the matter before that date. At the meeting the agents also considered the question of the differential rate allowed the Chicago & Alton on tickets from New York to St. Louis via Chicago and decided to request Vice-Chairman Pierson to issue an order to Eastern lines that such tickets hereafter be refused on the ground that the Chicago & Alton is no longer entitled to the differ-

ential rates. It is claimed that these tickets are used to Chicago, the remaining coupons falling into the hands of scalpers. The Alton Co. protests that there is no just cause for a change and claims that it has been allowed this rate for a number of years.

Lumber Rates to Missouri River Points.

The cutting of rates on lumber to Southwestern points, which troubled that traffic for some time, was caused by the contracts made by the St. Paul and the Omaha roads with the Eau Claire Lumber Co. The rates were but 2 cents higher from St. Paul than they were from Chicago. When the 15-cent rate from Chicago was enforced the St. Paul and Omaha roads charged but 17 cents, and later on when the 10-cent rate was made out of Chicago they were unable to make anything on their lumber traffic. They have promised to be guided by the result of the Conference Committee on Differentials, but later on withdrew their consent to the arrangement. These roads have now lost so much by the low rates that they have consented to be governed by the differentials the committee of seven may make, and it is therefore probable that a meeting will be held this week to dispose of the matter. In case the roads are dissatisfied with the committee's work the matter will be left to Arbitrator Bogue for settlement.—Chicago Inter-Ocean.

RAILROAD LAW.

Liability for Injury to Free Passengers.

In the Court of Common Pleas in New York city, Feb. 11, the suit of Immigration Commissioner Charles F. Ulrich against the New York Central & Hudson River Railroad Co. was tried. The suit was brought by Mr. Ulrich to recover damages for injuries received in the well known Spuyten Duyvil collision, and it came up on a motion made by counsel for the company to dismiss the case on the ground that plaintiff had no claim, as he was traveling on a free pass which contained a special clause exempting the company from liability for any injuries received by the holder. The Court granted the motion to dismiss, but remarked that a judgment of the Court of Appeals on this point would be desirable. An appeal will probably be taken.

Nuisance—Obstructing a Highway.

A dispatch from Wilkesbarre, Pa., Feb. 8, says: "A case of much interest occupied the attention of the court here the greater part of today. The North & West Branch Railroad, a branch of the Pennsylvania Railroad, was charged with being a nuisance in obstructing a public road in Conyngham township. It was alleged by the prosecutor that the company had taken possession of a portion of the roadway without providing another roadway, as provided by law. In addition to this it was stated that in the construction of their road they had thrown rocks and other obstructions upon the portion of the road they did not occupy. After able argument the case was given to the jury, who returned a verdict for the plaintiff."

Notice to Passengers of Arrival at Stations.

In Nunn against the Georgia Railroad Co., the Georgia Supreme Court last week held as follows:

"Where a passenger on a railroad train holds a ticket to a given point it is the duty of the company to stop its train at the point of destination a sufficient length of time to allow the passenger to leave it with safety to his life and person; and if he is carried beyond his stopping place, by no fault of his, but by the failure of the company's agent to do his duty in that behalf, he may recover any damage he may sustain. But it is not necessary to the performance of the ordinary duties of the conductor, in putting passengers off the train, that he should give them any other than the customary warning and opportunity to avail themselves of it. A mere voluntary promise on the part of a conductor to wake a drowsy passenger, and a failure to do so, whereby the passenger was carried beyond his destination, furnishes no case for recovery against the railroad."

2. How far a custom on the part of a conductor of assisting unattended females, children or infirm persons, known or which may be presumed to be known to the company, will modify these rules, is not decided.

Land Damages.

In the case of Mims and others against the Cincinnati & Georgia Co., the Georgia Supreme Court last week held as follows, affirming the judgment of the Superior Court:

1. If one who owned a tract of land divided it into lots, opened an alley through it, and sold lots on the alley, but did not in her deeds to the purchasers expressly reserve the right to have the alley revert to her when it ceased to be used as an alley, if such use ceased, the alley would attach to the abutting lots, although it had been open for seven years, and the public or any one who desired to use it had been permitted to do so.

(a). Where a railroad company owned all the land on one side of such an alley, and sought to condemn the land on the opposite side thereof, the owners of such land, in estimating the value of the lot, had a right to claim compensation for the easement in the alley and the right to a half interest therein when it ceased to be used as an alley.

2. While as an abstract proposition, it may have been objectionable to charge that the husband of the life tenant in the land sought to be condemned could not bind her without her express consent, authority or ratification; still, under the facts of this case, it did not affect the rights of the plaintiff in error. The wife had only a life estate in the property; there was a minor remainderman without a guardian; and whatever the husband may have said or done before the assessors and whatever his authority might have been from his wife, she had 10 days after the award to enter an appeal, and having availed herself of that right together with the remainderman, what was said and done before the assessors went for naught.

3. Upon the trial of a proceeding by a railroad to condemn land for its purposes, it was competent to ask a witness as to the value of a property, without restricting the question to the cash market value.

4. The verdict is in accordance with law and evidence.

OLD AND NEW ROADS.

Atchison, Topeka & Santa Fe.—This company has purchased the Silver City, Deming & Pacific road, which extends from Denning, N. M., to Silver City, 47 miles. The road was built last year and it reaches an important mining district and has so far done a remarkably good business for a new road. The Atchison Co. pays for the property \$700,000 in cash, it is said, taking all the securities issued by the company. To pay for this road an additional issue of \$800,000 of 6 per cent. collateral trust bonds will be made. These collateral trust bonds are part of the issue of \$10,000,000, of which about \$6,500,000 are now outstanding.

A dispatch from Topeka, Kan., Feb. 19, says: "The Board of Railroad Commissioners of this state, in a decision rendered Jan. 1, 1884, prescribed a system of reduced local freight rates for the entire Atchison system in Kansas. The

board also prepared a system of reduced special freight rates to and from Missouri River points. In its decision the Board admits the reasonableness of the company's former rates, but says the company's earnings are too large, and should be reduced \$900,000 per year by a system of reduced rates distributed among the people. These rates were ordered to take effect on Feb. 19. The railroad company has earnestly protested against the action of the Commissioners. To-day the company will announce to people living on its line that, in deference to the commission established by the people, it will to-day adopt, under protest, the entire system of mileage distance rates ordered by the Commissioners. The special rates, which cover the entire state and traffic crossing the state, and going to and from the state to other states, were yesterday enjoined in a suit brought by Eastern stockholders of the road in the Court of the Special Judicial District of Kansas. The injunction restrains the company from adopting these special rates, and restrains the Commissioners from endeavoring to enforce the penalty prescribed for the failure of the company to adopt the same.

Athens & Western.—Work was to be begun this week on the grading of this road at Athens, Ga., to Jug Tavern, on the Gainesville, Jefferson & Southern road, a distance of 19 miles. Sufficient money has been subscribed to grade the road and build all the bridges.

Boston & Albany.—In the Massachusetts Legislature, Feb. 14, Mr. Cummings, of Boston, presented a petition asking that the Judiciary Committee investigate the report whether this company has divided among its stockholders, with out consideration, the stock purchased of the state in 1882, and if so, whether such action is in accordance with the true meaning of the act authorizing the company to purchase the state stock. The petition was appropriately referred. Mr. Cummings made a long speech explaining the facts in the case and the purchase by the company of the 24,115 shares owned by the stock, which was paid for by the issue of \$3,858,000 in 5 per cent. bonds. The act provided that after the assignment of the stock the company might dispose of it as its absolute property. The stock when assigned was disposed of by making a stock dividend or distribution, and the company claims a right to do so under the act, although the making of stock dividends is expressly forbidden by the public statutes of Massachusetts, and the officers concerned in making such dividends are liable to indictment and fine. In this particular case Mr. Cummings claims that the public has to pay dividends on the same amount of stock as before the Boston & Albany made a purchase of the state of the interest of \$3,858,000 in bonds besides. This is not taking into account the payment of the principal of those bonds. He claims that the stockholders have received a dividend of about 20 per cent., and have made 20 per cent. more by the rise in value of their shares, and that, while this gain was legitimate in part, the rest of it, according to Mr. Cummings, was a great public wrong.

Camden & Atlantic.—This company makes the following statement for December and the year ending Dec. 31:

	December.	Year.	December.	Year.
Earnings.....	\$20,880	\$35,701	\$558,871	\$530,405
Expenses.....	28,369	27,996	393,067	360,083
Net earnings.....	\$7,489	\$7,705	\$166,804	\$190,322
Per cent. of exps.....	135.7	78.4	70.1	65.4

*Deficit.

This shows for the year an increase of \$8,466 or 1.5 per cent. in gross earnings, with an increase of \$31,984, or 8.9 per cent. in expenses, the result being a decrease in net earnings of \$23,518, or 12.4 per cent. Under the contract by which the business between Philadelphia and Atlantic City is now pooled the West Jersey has paid over about \$7,000 to this company to make up deficiencies.

Canadian Pacific.—A correspondent of the Port Arthur Herald states that about 5,500 men are now engaged under numerous contractors in grading this road north of Lake Superior, between Red Rock and Big Pic River, a section 135 miles in length, passing through Nepigon, Cypress Bay, McKay's Harbor, Jackfish Bay, Fort Caldwell, Port Monroe and Peninsula Harbor, all situated on or near the northern shore of Lake Superior. The rails are laid four miles east of Red Rock, which is 63 miles east of Port Arthur, and grading is about all completed for another 34 miles further east.

An iron bridge, 700 ft. long and 80 ft. high, is being constructed across the Nepigon River, and two of the stone piers are now completed. There are several tunnels on the line varying from 120 to 900 ft. in length, and two heavy rock cuttings of over 30,000 cubic yards each. Mr. Fitzpatrick is working the first 15 miles eastward from the Big Pic River. The country is exceedingly rough; the works, all through, probably the heaviest grading on the continent.

Central, of New Jersey.—The taking of testimony in the Dinsmore injunction suit against the lease of this road to the Reading was resumed in Philadelphia, Feb. 15. The most important testimony taken was that of ex Vice-President Cassatt, of the Pennsylvania Railroad. Mr. Cassatt testified that he had knowledge of the Central Railroad having been offered for lease to the Pennsylvania, but could not recall the exact year. It was in 1878 or 1879. Mr. Roberts and himself met Judge Lathrop and Mr. Cox, and the object of the meeting was to see whether they could not induce the Philadelphia to take a lease of the road. They subsequently reported to Mr. Thomas A. Scott, who was then President of the Pennsylvania, that it would not be advisable to make a lease. At that time they were shown the balance sheets and all other information necessary to arrive at a conclusion in regard to the condition of the company. Mr. Cassatt said that the lease had never been seriously considered by the Pennsylvania Railroad directors.

Chester & Lenoir.—Work on the extension of this road from the Junction with the Western North Carolina at Hickory, N. C., northwest to Lenoir, which is to be the terminus of the road. The bridge over the Catawba River was completed last week, and the track is laid to the Mill trestle in Caldwell County, 8 miles from Hickory, leaving about 12 miles to reach Lenoir.

Chicago & Northwestern.—The following statement of earnings of this road for the seven months of the fiscal year from June 1 to Dec. 31 is published by the *Commercial and Financial Chronicle*:

	1883.	Net.	1882.	Net.
June.....	\$2,213,022	\$788,497	\$2,043,516	\$856,600
July.....	2,169,631	884,606	2,059,953	971,703
August.....	2,403,459	935,365	2,211,623	922,630
September.....	2,647,969	1,044,472	2,555,041	1,352,592
October.....	2,793,091	1,476,006	2,601,445	1,411,495
November.....	2,368,542	1,073,114	2,109,418	950,080
December.....	1,760,556	642,754	1,826,929	795,081
Total.....	\$16,348,171	\$7,225,804	\$15,405,940	\$7,259,941

For the seven months this shows an increase of \$942,231, or 6.3 per cent., in gross earnings, with an increase of \$976,368, or 12.0 per cent., in expenses, the result

being a decrease in net earnings of \$34,137, or 0.5 per cent.

This company has decided to issue \$1,600,000 Ottumwa, Cedar Falls & St. Paul 5 per cent. first-mortgage bonds upon the road it is building into the coal-fields of Iowa. The Northwestern guarantees the principal and interest of the bonds, and it is reported that they have been taken by Kuhn, Loeb & Co., of New York.

Chicago & Eastern Illinois.—It is stated that the negotiations for the sale of this road, or a controlling interest in it, to Jay Gould have fallen through. Mr. Gould not being willing to pay the price which the stockholders wished to get. It is very probable, however, that the negotiations may be reopened.

Chicago & Grand Trunk.—This company has begun to build a new freight house at Twelfth street and Third avenue in Chicago. It will be of brick, 304 ft. long and 50 ft. wide, two stories high, with an office building on Twelfth street, 30 by 50 ft., and three stories high.

Cincinnati, Columbus & Hocking Valley.—The Union Trust Co., of New York, has begun a suit in the United States Circuit Court at Cincinnati to foreclose the mortgages on this road and the Court has appointed a receiver. The road is a narrow-gauge line extending from Jeffersonville, O., to New Burlington 25 miles, and has always had very light business.

Cincinnati, New Orleans & Texas Pacific.—At the annual meeting in Cincinnati, Feb. 18, charges were presented by a stockholder to the effect that there was a sum of \$220,000 not accounted for in the company's statements. A special committee of stockholders was appointed to examine into the management of the road and to report to an adjourned meeting. A committee was also appointed to ask the Board of Public Works for a strip of land from Lincoln Park for depot purposes.

Colorado, San Angelo & Southern.—This company has been organized to build a railroad from Colorado to Mitchell County, Tex., on the Texas & Pacific road, to San Angelo, in Tom Green County. The distance is 8 miles.

Concord.—A recent meeting of the directors of this company and of the Northern Railroad was held in Concord, N. H., when the question of entering into arrangements for the operation of the two roads under a joint management was considered. It is said that committees were appointed to prepare a contract to be submitted to both boards.

Conotton Valley.—No additional bonds have recently been deposited in favor of the reorganization plan. The proposed assessment on the bonds under this plan is objected to by some of the smaller holders, and it is thought that the plan will be altered so as to provide for the costs of foreclosure by the sale of new securities, thereby avoiding an assessment. It is very probable that the plan in other respects may be materially changed before its final adoption.

Crawford County.—This company has been organized by parties who bought the Nebraska, Topeka, Iola & Memphis Railroad at foreclosure sale. The road is now completed and in operation from Girard, Kan., to Walnut, 16 miles, and has considerable local business chiefly in coal. The new company does not intend to build any extension of the road at present.

Deer Park & Utica.—This company has filed articles of incorporation to build a short railroad from Utica, Ill., through the townships of Deer Park and Vermillion to Tonica, in La Salle County.

Denver & Rio Grande.—This company makes the following statement for the year ending Dec. 31 last:

Gross earnings.....	\$7,361,545
Expenses (64.4 per cent.).....	4,743,111
Net earnings.....	\$2,618,434
Receipts from other sources.....	114,531
Total net income.....	\$2,732,965
Fixed charges.....	2,625,000
Surplus.....	\$107,965

The earnings and expenses of the Utah lines are included. The fixed charges include all payments not reported in operating expenses for the year.

Floods in the Ohio.—The high water in Cincinnati last week completely stopped the running of trains into the city, the Cincinnati, Hamilton & Dayton being the last road compelled to stop. That road, however, resumed running trains to its station Feb. 18, and was followed on the next day by the Pittsburgh, Cincinnati & St. Louis. The other roads are still compelled to stop their trains in the outskirts of the city, while the Ohio & Mississippi and the Cincinnati, Indianapolis, St. Louis & Chicago keep up their connections by steamboat transfers. The last named road suffered very serious damage below the city and will require heavy repairs. At latest accounts the water was falling rapidly.

At Louisville not much damage was done to the roads entering the city from the south, but on the north side of the river, at Jeffersonville and New Albany, the roads were entirely cut off and considerable damage done to their tracks. The total loss from this flood to the railroads will be quite as large as that resulting from the great flood of last year, while the losses from interruption to traffic and diversion of business will be very considerable.

Further up the river the losses at and about Wheeling were large, as noted last week. The new Ohio River road, which was nearly finished from Benwood to Parkersburg, has been so much damaged that much of it will have to be rebuilt. The losses by the flood in Pittsburgh and its neighborhood were large, but comparatively a small part of them were on railroad property.

Florida Transit & Peninsular.—A meeting of the stockholders has been called for Feb. 28 next at Fernandina, Fla., to consider a plan for the consolidation with the company of the Florida Central & Western, the Fernandina & Jacksonville and the Leesburg & Indian River companies. The Florida Transit & Peninsular Co. already controls the other companies named and operates their lines.

Georgia Pacific.—This company makes the following statement for December and three months of the fiscal year from Oct. 1 to Dec. 31.

	December.	Three months.
Earnings.....	\$58,883	\$157,110
Expenses.....	29,763	84,611
Net earnings.....	\$29,120	\$72,499
Interest charges, three months.....		44,550
Surplus.....		\$27,949

This is a very good showing for so new a road. The bonded debt is \$10,000 per mile of road. No comparison can be made, as the road was but partly finished a year ago.

Greenville & Laurens.—The contractors on this road have put about 300 men at work, commencing at Greenville, S. C. They are employed in the grading and in cutting out the right of way through the woods. The force is shortly to be increased.

Hartford & Connecticut Valley.—This company asks the Connecticut Legislature to abate \$15,000 of back taxes, claiming that it takes all the income of the road to keep the line in repair, and that it was originally assessed at so high a figure that it has already paid a large excess of taxes, and in equity ought to have a rebate.

Illinois Southern & Paducah.—This company has been organized to build a railroad from a point on the Ohio River opposite Paducah, Ky., northwest to Carbondale on the Illinois Central. The distance is about 60 miles.

International, of Mexico.—A dispatch from Laredo, Tex., says that Hunter, Sampell & Moore, the contractors who graded this road for 100 miles from Laredo, Mexico, southward, have procured a judgment for \$234,000, under which the property of the company will be sold within 20 days.

La Crosse, Iowa & Southwestern.—This company's engineers have begun a preliminary survey of the projected line, starting from St. Joseph, Mo., and working northeast.

Lehigh Valley.—The report which came from Philadelphia last week of the lease of this road to the Pennsylvania Co. is denied by the officers of both companies. This report is not new, but has been brought out at intervals during the past year.

Macon & Florida Air Line.—The engineers employed in making a preliminary survey of this road have completed the line from Macon, Ga., to the crossing of the Brunswick & Western road at Tipton, and expect to reach Lake City, Fla., early in March. The line so far is nearly straight, and but very little heavy work.

Mexican Railroad Notes.—The following notes are from the *Mexican Financier* of Jan. 26:

On the Merida & Peto Railway, in the months of November and December two kilometers, 39 and 40, of track were finished.

The receipts of the San Martin Texmelucan Railway for December were \$3,137.42. The number of passengers carried was 14,095.

The track of the Puebla & Izucar Matamoros Railway has been laid up to kilometer 45. In November the number of passengers carried between Puebla, Cholula and San Augustin was 10,646, and in December, 9,693.

The highest point of the Inter-oceanic Acapulco, Morelos, Mexico, Irolo & Vera Cruz Railway, on its Morelos Division is El Central, between the stations of Amecameca and Ozumba, 2453.5 meters, or 8047.5 above the sea-level. The altitude of Cuautla is 1267.2 meters or 4155.7 feet, making a descent of 1186.3 meters, or 3891.7 feet, from Central to Cuautla.

On the Mexican Central, work on the permanent iron bridge at Encarnacion is now making good progress. There being an ambulance now running three times a week between the ends of the tracks, the company announces that it is prepared to take a few passengers without baggage each trip, selling through tickets from here (City of Mexico) to Paso del Norte at regular first-class rates. Beginning to-day passengers who leave here at 6:15 in the morning will reach Zacatecas at 2:45 the next afternoon, with a stop at Lagos from 8 o'clock to 11:30 in the evening, giving time for supper.

These additional items are from the *Mexican Financier* of Feb. 2 last:

The Secretary of Public Works has directed a circular to the railway companies calling their attention to the obligations imposed upon them by the government regulations to submit a general report annually. Another circular has been addressed to the railway inspectors, directing them to send in reports of the exact distances between the stations and other important points on the railway lines.

Mr. José F. Godoy, the general agent and representative for this republic of the Mexican Cable Tramways Co., of San Francisco, has arrived here, and his project, which is meeting with such success in San Francisco and Chicago, while it is about to be introduced in New York, Boston and other large cities, is already receiving favorable attention here. In answer to the objections which we have said might possibly work against the operation of the cable system here, the subsoil water standing so near the surface, we learn that this is provided against by the water-proof tubes in which the cables run, while, in case of flooded streets, in the rainy season, the cable is so arranged that it can easily work under water several days.

The officials of the Mexican Central are busy with preparations for the opening of the railway as a great through line, which is now a matter of but a few weeks at the most. We have had the privilege of seeing the plans for the new Pullman palace sleeping cars, which are now building for the Central's through express trains by the Pullman Co., at Chicago. They are to contain all the latest improvements for the comfort and pleasure of the traveler. They will be 64 feet long and will contain 24 sleeping berths, or 10 sections and a stateroom. At the stateroom end of the car will be the ladies' toilet rooms, and those for gentlemen at the other end, where there is also a smoking room and a buffet for serving light lunches. The cars will be finished in costly woods and elegantly furnished. Provision is made for heating the cars as may be needed during the cool nights in the northern part of the republic. Journeying by these cars will indeed be a luxury, and will open a new era in Mexican travel. That they will be appreciated is shown by the frequent inquiries made by Mexican patrons of the railway concerning them.

Minnesota Railroads.—The report of Railroad Commissioner J. H. Baker for the year ending with August last gives the following:

Miles of railroad in Minnesota.....	3,618
Cost of railroads in Minnesota.....	\$150,071,150
Per mile.....	43,969

Earnings:	
Passenger earnings.....	\$5,818,254
Freight earnings.....	16,580,436
Other earnings.....	1,169,400

Total earnings.....	\$23,568,090
Per mile.....	6,390
Working expenses.....	13,285,337
Per mile.....	3,529
Net earnings.....	10,272,753
Per mile.....	2,710

The Commissioner reports that during the calendar year 1883 137 1/2 miles of new road were completed in Minnesota, making the length in the state at the close of the year 3,905 miles. Poor's Manual reported 3,974 miles in the state at the end of 1882.

Moline-Rock Island Southern.—This company has been organized at Rock Island, Ill., to build a railroad from that city southeast to Peoria, about 90 miles.

New York & New England.—The Massachusetts House has passed an order giving the State Treasurer the power of attorney to represent the state in the New York & New England litigation, after striking out the clause authorizing him to exchange bonds held by the state.

The following balance sheet has been published, showing

the Receiver's statement of the condition of the company on Dec. 31 last:

Liabilities:	
Capital stock	\$20,000,000.00
Funded debt, bonds	12,833,000.00
Funded debt, real estate and equipment	2,744,480.76
Unfunded debt, accrued interest, notes payable, unpaid vouchers, pay-rolls, etc.	2,097,506.37
Gross earnings, Oct. 1 to Dec. 31	935,023.12
Profit and loss balances as stated Sept. 30	169,402.58
Total	\$38,779,392.83
Assets:	
Permanent investments	\$36,033,281.31
Accounts, in nature of assets, supplies, materials, etc.	1,523,884.44
Accounts not assets, operating expenses three months, taxes, insurance, interest, etc.	1,222,223.08
Total	\$38,779,392.83

The Receiver makes the following further report regarding the financial condition of the company:

"In accordance with the spirit of a vote passed by the board of directors of the New York & New England Railroad Co. on Dec. 10, the condensed general balance sheet of the company on Dec. 31, 1883, with the schedules referred to therein, is transmitted herewith to the stockholders as a statement of the whole liabilities and assets of the company." The following is submitted by the Receiver as a statement of the 'immediate liabilities and quick assets of the company' called for by the same vote. Reference to the balance sheet upon the credit side shows an indebtedness of \$2,097,506.37. To this should be added the following indebtedness, which has not been entered upon the company's books:

Estimated amount due on 302 claims for fire damage	\$20,000.00
Estimated amount due upon 1,500 claims for overcharge and loss and damage to freight	30,000.00
Ascertained amount on this description of claims not included in the balance sheet	13,473.78
Estimated amount due on suits, mainly for personal injury	85,000.00
Estimated amount due on other claims in litigation	60,000.00
Amount of bills rendered by various counsel not yet audited	7,000.00
Estimated amount due for rolling stock belonging to other companies destroyed	6,500.00
Connecticut taxes postponed, due Dec. 1, 1884, not included on balance sheet	18,138.34
Gross unfunded debt of the company Dec. 1, 1883	2,337,618.49
Against this the balance-sheet contains a statement of accounts in the nature of assets amounting to	\$1,523,884.44
From this should be deducted supplies and materials on hand as per inventory	\$550,385.82
Estimated amount of worthless accounts due from agents and conductors	6,000.00
Doubtful accounts due from companies and individuals, including those in litigation	125,000.00
Reduction in value of 920 shares capital stock, valued in balance-sheet at \$50, now worth in the market not over \$15 a share, difference being	32,200.00
	713,585.82

Leaving the quick assets of the company Dec. 31, 1883, \$810,302.62. If, therefore, from the unfunded debt as stated, \$2,337,618.49, be deducted the quick assets as stated, \$810,302.62

The debt of the company (including interest accrued) Dec. 31, 1883, is \$1,527,315.87

"It will be observed that, in making this statement (which is prepared mainly to show the stockholders how much money the company needs), the entire amount of materials has been deducted. Opinions may vary in regard to the propriety of this deduction. It is always necessary to carry a certain stock of supplies. The real question is whether the stock should be carried on credit or be owned by the company. If, however, it must be carried on credit, the figures should be reduced as follows: The amount of inventory is stated at \$550,385.82, but it includes material on hand to be used immediately in the construction of second track, which cannot therefore be properly regarded as supplies. The value of these materials is stated by the Chief Engineer at \$137,336. The Purchasing Agent of the road estimates that the prices stated exceed present market value by about 15 per cent.—say \$62,000—making a total deduction of \$199,336, and leaving as the value of materials and supplies on hand \$351,049.82. If, therefore, the supplies on hand must be carried on credit, the amount of the net floating debt would be reduced only to that extent. Considering the net debt on Jan. 1, 1884, to be \$1,527,315.87, it must be remembered that the amount is constantly varying, being increased by the interest steadily accruing, and decreased by the net earnings of the property. The Auditor's estimate of the fixed charges for the year ending Dec. 31, 1884, is as follows:

Taxes	\$113,712.84
Insurance	25,000.00
Rent of other roads	108,150.00
First mortgage bonds, \$6,000,000, 7 per cent.	\$420,000.00
First mortgage bonds, \$4,000,000, 6 per cent.	\$240,000.00
Second mortgage bonds, \$3,000,000, 6 per cent.	180,000.00
Total	\$840,000.00
Boston & Albany Railroad (50-acre lot)	6,000.00
Commonwealth of Massachusetts	40,461.28
Drake's wharf mortgage note	6,250.00
Piper wharf	11,280.00
Car trust certificates	74,460.00
E. W. Clark & Co. car trust equipment	5,725.68
Notes payable	1,555.00
Total	\$985,731.96

"This does not include interest on floating debt, which (if stated at \$1,500,000, and borrowed at 6 per cent.), will add \$90,000 per annum. An inspection of the balance sheet shows, as the result of the operation of the road for the three months, from Sept. 30 to Dec. 31, 1883, gross earnings of \$935,023.12. The amount charged to operating expenses, taxes, insurance and track rentals, as shown by the same balance sheet for the same time, was \$915,169.71. The difference between these two sums, namely, \$19,853.41, was earned toward the interest upon the company's funded and floating debt. It will be observed, however, that the taxes for substantially the whole year (\$9,602.08) are charged against these three months' earnings, so that properly the real net earnings of the property applicable to the payment of interest for the three months were about \$95,000. The interest which accrued during these three months, as estimated by the Auditor, was \$238,359.16. The Receiver hopes, however, to materially increase the earnings of the property by a reduction of expenditures, and by the discontinuance of unprofitable traffic, and believes that the result of future operations will be more encouraging to the holders of the securities. To that end he pledges his earnest efforts."

Argument was begun in Hartford, Conn., Feb. 18, on the

motion to remove the Receiver. A number of counsel are to be heard, and the hearing will probably occupy several days.

At the close of the hearing Judge Shipman stated that he considered it very important that the title of the Receiver should be established beyond question. By agreement with counsel the case was then adjourned until Feb. 28, at New Haven, when the decision of the court will be given.

New York, Pennsylvania & Ohio.—The motion for an injunction asked for by James McHenry and others to prevent the present management of the company from issuing deferred warrants for interest on the bonds prior to the trial of the action to abrogate the lease of the road to the Erie, came up for argument before the United States District Court in Cleveland, O., Feb. 15.

New York, West Shore & Buffalo.—The details of the financial plan that is said to have been agreed upon by the committee of the board are said to be as follows: First mortgage bondholders are to be asked to surrender three coupons for which \$3,750,000 in 6 per cent. debentures will be issued, to run 10 years, the company having the right to redeem them at any time. A second mortgage is to be made upon the property of the company for \$30,000,000, subject of course to the lien of the \$50,000,000 first mortgage bonds. These bonds are to bear 5 per cent. interest and to be divided into two series. Of the series A bonds \$12,000,000 will be issued in exchange for the \$12,000,000 terminal bonds, and \$3,000,000 will be applied to completing construction and in payment of the floating debt. In addition \$2,000,000 are to be raised for the purchase of equipment under a car trust, to run for five years at 8 per cent. interest. The \$15,000,000 bonds of the second series are to be income bonds, and are to be used in settlement with the North River Construction Co. These second series or income bonds are to carry with them \$20,000,000 in stock to be held by the trustee of the second mortgage and represented by convertible certificates, conversion to be allowed after payment of interest on the bonds for two years from earnings.

Mr. Warren Currier, who lately began suit against the road, has made application to the Attorney-General of New York to begin action against the company in behalf of the people, on the ground that the contract between the company and the North River Construction Co. was fraudulent and void. The Attorney-General has granted the application so far as to enter an appearance.

Northern Pacific.—Bids have been received for the construction of part of the Cascade Division which is to extend from Wallula on the Columbia River to New Tacoma. No awards have yet been made and it is somewhat uncertain when the contracts will be let. Something will probably depend upon the action of Congress in relation to the land grants.

A long letter written by Gen. Herman Haupt, late General Manager of the road, has been published, with the statement that it was not intended for publication, but that a copy of it came accidentally into outside hands. In it Gen. Haupt reviews his administration of the road, and criticizes what is claimed to be the unwise economy of the board in forbidding necessary repairs and renewals, and cutting off expenditures which were necessary for the proper maintenance of the road and its equipment. He also urges more active efforts to encourage settlement along the line, the great need of the road being population in the country which it serves.

Ohio River.—The grading and track-laying of this road were a few weeks ago very nearly completed from Benwood, below Wheeling, to Parkersburg, W. Va., along the West Virginia side of the Ohio River.

The recent floods in the Ohio have, however, so damaged the road in some places and in others covering it with mud and sand so that a large part of it will have to be rebuilt and it is now entirely uncertain when it will be completed or open for business.

Philadelphia & Atlantic City.—Preparations are in progress to change this road from 3 ft. 6 in. to standard gauge. The ties will be renewed throughout and the road laid with heavy steel rails. Six standard gauge engines are now being built for the road at the Reading shops of the Philadelphia & Reading Co., which now owns the road.

Pittsburgh & Buffalo.—This company has filed articles of incorporation in Pennsylvania. It is formed by the consolidation of the Pittsburgh, Buffalo & Rochester and the Brandy Camp railroad companies.

Pullman's Palace Car Co.—This company has given notice that the additional 10 per cent. of its capital stock being the remainder of the new issue of 20 per cent. authorized in October last will be issued on March 1 next. All stockholders of record on that date will have the right to subscribe at par for new stock in the proportion of one share for each ten of their present holdings. The new issue will make the total capital stock of the company \$15,927,200. The company makes the following statement for the five months ending Jan. 1, 1884: Earnings, \$2,059,659; expenses, dividends, etc., \$1,846,659; deduct payments to railroad companies, \$215,195; add profits of manufacturing, \$186,067; surplus, \$683,841, an increase of \$146,283 over last year.

Richmond & Danville.—This company makes the following statement for its own and controlled lines for the month of January:

	Gross earnings—	Net earnings—
	1884.	1883.
Richmond & Danville	\$269,589	\$259,757
Char. Col. & Augusta	65,373	70,617
Col. & Greenville	56,046	71,078
Virginia Midland	107,115	104,387
Western N. C.	29,213	20,091
Total	\$525,238	\$525,930

*Deficit.

This shows for all the lines a decrease of \$692, or 0.1 per cent., in gross earnings; an increase of \$46,568, or 14.3 per cent., in expenses, and a decrease in net earnings of \$47,260, or 23.6 per cent.

Rutland.—This company has brought suit against Mr. John B. Page, its former President, to recover money claimed to have been misappropriated under his management of the company's affairs, the damages being put at \$200,000.

St. Louis & Chester.—At a meeting held in Waterloo, Ill., Feb. 9, this company was reorganized and an entirely new board of directors chosen. The stockholders instructed the board to prepare a plan for the immediate commencement of work on the road.

Springfield & Southern.—This company has filed for record at Springfield, Ill., a mortgage to the American Loan & Trust Co., of New York as trustee, to secure bonds to be issued at the rate of \$13,500 per mile as the road is completed.

Texas & St. Louis.—The United States Circuit Court has authorized the Receiver to issue certificates to the

amount of \$184,000, to bear 7 per cent. interest. The money raised by this issue is to be used to pay off the men's wages and amounts due contractors. The Receiver states that the amount due for back wages is \$134,500.

Thames River Bridge.—A conference was held Feb. 19, between the city officers of the city of New London, Conn., and the officers of the New York, Providence & Boston, the New York, New Haven & Hartford, and the New London Northern companies in relation to the approach to the new railroad bridge across the Thames River. The line agreed upon, which will be submitted to the Railroad Commissioners, runs partly through Water street and partly through private property. The tracks of the New London road now upon Water street will be removed. A large Union passenger station will be built on the site of the present support. Little or no opposition was made by the city to the proposed plan.

Toledo, Cincinnati & St. Louis.—The Receiver has been authorized by the Court to issue certificates to an amount sufficient for the purchase of 1,000 tons of steel rails to be used where most needed in relaying the track. It has been reported that the bondholders' committee has under consideration a plan for changing the road from 3 ft. gauge to standard gauge, the cost of the change to be paid by an issue of receivers' certificates, of which some \$3,000,000 would be required. It is doubtful, however, whether the Court would authorize so large an issue, and it is also considered doubtful whether the majority of the bondholders would approve of it, or at least be willing to contribute toward it at present.

Union Pacific.—This company's statement for December and the year ending Dec. 31 is as follows, including leased lines:

	December—	Year—
	1883.	1882.
Earnings	\$2,407,215	\$2,559,005
Expenses	1,730,889	1,365,232
Net earnings	\$676,326	\$1,193,783
Per cent. of exps.	71.9	53.3

The increase in the December expenses was largely for renewals of rails, track expenses and taxes, the increase in the latter item alone amounting to \$61,000 for the month and \$107,000 for the year. About one-half of the increased expense for December was incurred on the lines in Colorado.

For the year this shows a decrease of \$602,983, or 2.0 per cent., in gross earnings, with an increase of \$608,221, or 3.8 per cent., in expenses, the result being a decrease in the net earnings of \$1,211,154, or 8.5 per cent.

Utah Eastern.—The committee appointed at a recent meeting of the outside stockholders report that the company up to December, 1883, had done a considerable business in carrying coal, lumber and other freights, and that it had made a contract to carry coal for a term of years to the Ontario mines. In November last, however, after the present board of directors had been elected, all trains were taken off the road and it was practically abandoned, its business being transferred to the Echo & Park City road, which is owned by the Union Pacific. No trains are now run over the road. This report was received by the stockholders and the committee was authorized to engage counsel and take the necessary legal measures to defend the interests of the minority stockholders and to compel the directors to operate the road.

Washington, Ohio & Western.—At a meeting of the stockholders held in Alexandria, Va., last week, resolutions were adopted authorizing the execution of a first mortgage to secure lands at the rate of \$25,000 per mile were adopted. It is intended to use these lands to pay for the extension of the road to Winchester, Va. Considerable progress has been made in putting the road in good condition and replacing the worn out iron rails with steel.

Williamsport & North Branch.—Work on the extension of this road has been progressing steadily all winter and tracklaying will soon be begun. It is now in operation from Halls, Pa., on the Philadelphia & Reading road, to Hughesville, 6½ miles, and the company expects to have trains running by May to Jonestown, 20 miles from Halls. Through that distance the road passes through a farming country, but beyond Jonestown it will enter the heavily timbered country on the North Mountain where some heavy grades will be required to reach the summit. The intention is to build the railroad through to Bernice, the terminus of the State Line & Sullivan road, from which point a considerable coal traffic is expected. Beyond Bernice the intention of the company is to build northward, crossing the Susquehanna at Wysox, and thence following the Wysox Valley to Nicholls, N. Y., on the Delaware, Lackawanna & Western road, 10 miles west of Oswego. It is not expected, however, that anything will be done beyond Bernice this year.

Wilmington & Northern.—This company has about completed a branch three miles long in Wilmington, Del., which reaches the Dupont powder mills and other factories. It is intended for freight purposes entirely.

It is stated that the company will this spring put on fast passenger trains and make other arrangements intended to secure a share of the business between Central Pennsylvania and Baltimore, Washington and southern points.

Wisconsin Central.—The Boston Transcript of Feb. 16, says: "President Colby, of the Wisconsin Central, is in Boston. He has succeeded in raising \$2,500,000 for the building of the line between Chippewa Falls and St. Paul, 104 miles, which will give the Wisconsin Central another connection with the Northern Pacific and the great Northwest, beside that to be made by the extension which the Northern Pacific is building between Duluth and Ashland. This will make the Wisconsin Central a double line extension of the Northern Pacific to Milwaukee, and, eventually, beyond that city, as it is understood that the next extension to be entered upon by the Wisconsin Central people will carry their system into the city of Chicago. This will make this formerly bankrupt wilderness line a railroad system in Wisconsin of almost as much importance in that state as the Chicago & Northwestern or the Chicago, Milwaukee & St. Paul systems. The Wisconsin Central has a traffic contract with the Northern Pacific for business by way of Ashland, and will undoubtedly have another for business by way of St. Paul when this St. Paul extension is completed. The Milwaukee & Lake Winnebago road, built as an independent line by the Wisconsin Central Co., but leased to it, is turning out a very profitable investment for the subscribers. The subscription was offered *pro rata* to all Wisconsin Central stockholders, but only the larger stockholders took any interest in it, as it was not looked upon as very promising at the time. The subscription gave for \$10,000 cash \$10,000 in first mortgage 6 per cent. bonds, \$2,000 in 5 per cent. income cumulative bonds, \$1,000 in 6 per cent. cumulative preferred stock, and \$2,000 in common stock—a total of \$15,000 at par in securities. This subscription was offered March 10, 1883, and closed March 25. It is understood that the road is now earning not only its first mortgage interest but interest upon its income bonds and 5 per cent. upon its preferred stock."